

# AUTOMOTIVE INDUSTRIES

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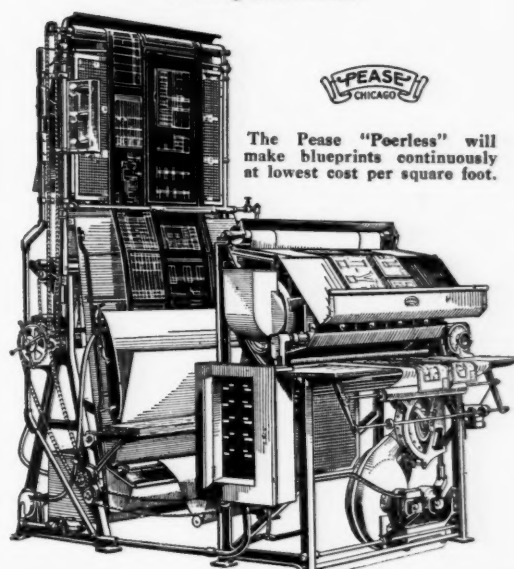
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# AUTOMOTIVE INDUSTRIES

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NUMBER 17

## Vehicle Builders Buying More Parts *from Outside Sources*

*Tendency to patronize independent parts manufacturers is stronger than generally believed. Ford is placing heavy orders. Many others adopt same policy.*

By Norman G. Shidle

PASSENGER car and truck manufacturers are patronizing independent parts manufacturers today more than at any time in a good many years.

The continued trend in that direction is far stronger than any casual observer realizes because many complete vehicle makers still feel that some special sales virtue exists in emphasizing the completeness of the job done in their own factories. Consequently, a general impression grows that more and more work is being done in the plants of the vehicle makers themselves and less and less by the independent parts manufacturers.

But new facts are arising every day to prove that general impression false. Manifold examples might be cited; there is no need to name names in proving the case, but one or two specified instances may not be amiss to show just what is occurring.

Ford is generally known to have been contacting with independent parts makers of many kinds during the last few months in an attempt to arrange for the production of a good share of certain units. In some cases, it is understood, Ford is planning to have as much as 50 per cent of his requirements manufactured by outside sources as a permanent rather than a temporary policy. A good volume of Ford business is already

being handled by independent parts companies, not only on Model A, but also, it is understood, on Model T replacement work.

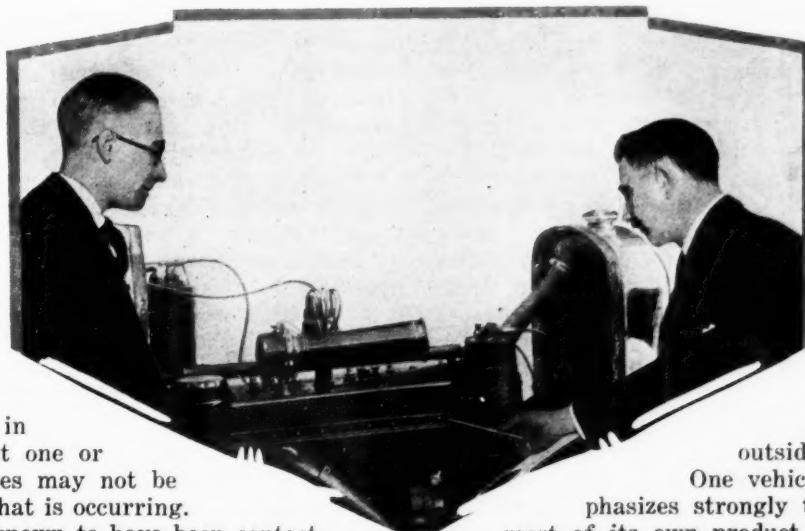
One manufacturer of a successful high-priced car, generally thought of as producing practically everything within his own plant, buys outside not only part of his body requirements but also a number of finished engine parts.

Another car maker in the middle-priced group who has been making his own engines for one of his lines and buying outside for another of his models, next year probably will buy engines for both lines from an outside source. One reason for this policy, it would seem apparent, must be satisfaction with an outside source of supply.

One vehicle company which emphasizes strongly the fact that it builds most of its own product is today buying more different parts outside than it was five years ago. Its volume of outside buying in dollars has risen as well, of course, with the growth of its sales.

Vehicle makers who a year or so ago turned to the independent parts manufacturers for units for models considered more or less experimental so far as sales were concerned, today are still buying from those out-

*ONE car maker who has been making his own engines for one of his lines and buying outside for another of his models, next year probably will buy engines for both lines from an outside source. One reason for this policy, it would seem apparent, must be satisfaction with an outside source*





side sources and give every indication of continuing to do so, although the cars in which the units are used are now established as permanent factors in the market.

Several important car and truck makers in 1929 seem likely to turn to outside sources for important parts of their vehicles for the first time in their history.

No longer are the published specification tables any adequate or accurate guide to the amount of business being handled by independent parts manufacturers. In too many instances the independent source is functioning practically as the engine or clutch or gearset or whatnot department of the vehicle manufacturer, building for him a unit specially designed and produced according to strict requirements of that individual vehicle maker. Sometimes the car maker owns the tools or dies being used in the parts plant. In these instances, the vehicle company often insists on stating publicly—and with considerable justice in many cases—that the unit is of its own manufacture.

In addition to all of these current indications of new business for the independent parts makers, there is, of course, still the usual volume of spark plugs, universal joints, generators, ignition systems, tires, wheels and other items which nearly all vehicle makers have always been in the habit of buying from specialty manufacturers.

In outlining these seemingly favorable aspects of the future of the independent parts factory as they appear at present, there is no thought of entering the discussion about when a unit properly can be listed as "own make" by a vehicle maker and when it cannot. That is almost purely a sales question best decided by the individual manufacturers in individual cases. The point has been emphasized here merely to bring into relief the very definite elements which are converging to brighten the independent parts maker's picture.

In addition to the factors mentioned above, 1928, being a generally good business year, has brought about no marked diminution of success on the average for the makers of cars frankly announced as assembled products. Hard times have been experienced by one or two producers in this category, but taken as a whole their progress has been well in line with that of the industry as a whole. In certain instances there are strong indications that some of these companies will do even better in 1929 than they did in 1928 and

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**"FIRST-HALF-OF-THE-YEAR** figures indicate that the parts makers have fared approximately as well relatively as the vehicle makers from a profit standpoint, although comparisons of this kind are hazardous because of lack of complete data on both classifications.

"It is plain, however, that parts and accessory company stocks are currently very favorably regarded by the investing and speculating public. Standard Statistics figures show an average yield of about 4.6 for the common stocks of a group of 19 car and truck companies as compared with an average yield of 3.7 on the common stocks of a group of 17 parts and accessory makers, the calculation having been made as of September 22, 1928."

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thus offer a slightly better rather than a diminished market for the products of the independent parts maker next year.

Profit figures for the first half of the year reflected a good average of prosperity among independent parts producers and accessory manufacturers, while third-quarter estimates indicate a continuance of this favorable trend. Half year figures indicated that the parts makers have fared approximately as well relatively as the vehicle makers from a profit standpoint, although comparisons of this kind are hazardous because of lack of complete data on both classifications.

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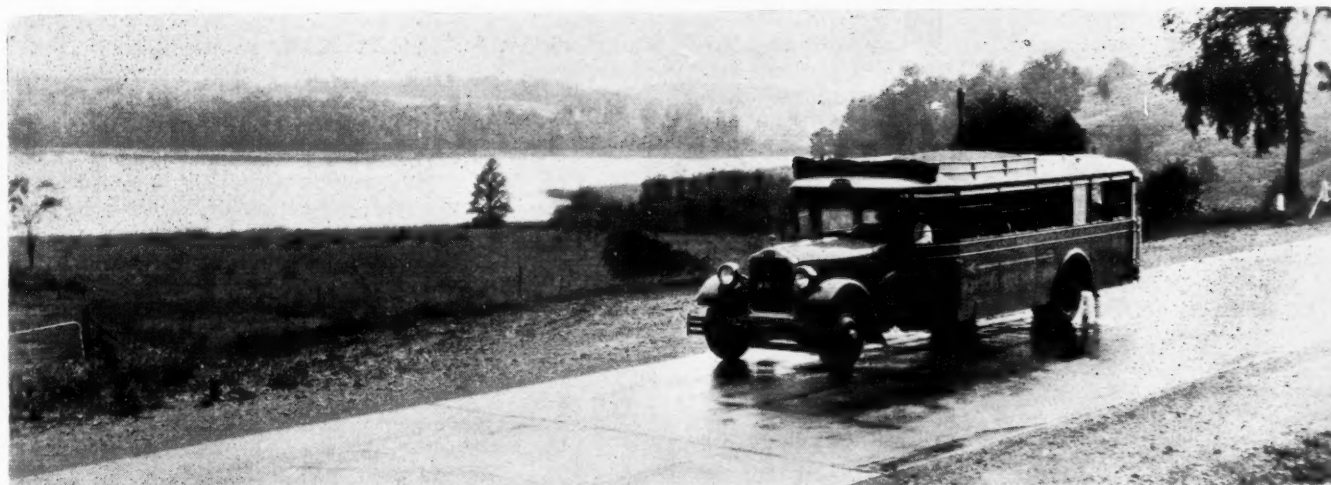
In considering the future of this supply end of the automobile business, the many mergers of such companies which have taken place in the last 12 months also merit attention. Will those mergers strengthen the general situation; or will they fail to make any material change? Without trying to answer those queries in any final form, the comments made as regards parts and accessory mergers by George Graham, vice-president, Willys-Overland Co., a few weeks ago are significant.

"Within the last 17 months," Mr. Graham said, "there have been mergers of parts and accessory concerns having assets of more than \$250,000,000. This development means many things. It means especially that manufacturers are more and more going to buy certain parts instead of making them. In this way they are saved from big plant expansion and heavy carrying costs. The fact that parts makers specialize on certain units with the natural development of a highly trained technical skill means a better product at a lower price.

"This is an interesting reversal," Mr. Graham went on. "To some extent it takes the industry back to the days when the manufacturer bought most of his parts and assembled them. With today's tremendous volume, there is more of a market for the facilities of the parts and accessory manufacturers than ever before."







# Commercial Vehicle Builders Urge Owner Organization

Plan to develop better cooperation between operators is announced at S.A.E. Transportation Meeting. Design and maintenance discussed. Six-Wheel symposium

*By John C. Gourlie*

**A**FFORDING one of the rare occasions on which representatives of commercial vehicle manufacturers and operators can meet for the discussion of mutual interests, the Transportation Meeting of the Society of Automotive Engineers, held Oct. 17-19, in Newark, N. J., was unusually productive of a study of the important questions of the industry today, among which may be detailed the following:

The demand of operators for special equipment to meet particular problems, as opposed to the need for standardization in the interest of economical production.

The desire of operators for selective selling to bar the poorly financed and managed truck owner.

The desire of operators for more and better information from manufacturers in the matter of chassis parts.

The results of testing, under operating conditions, of certain accessories not always standard equipment on commercial vehicles.

Legislative developments favoring the six-wheel truck in certain localities and under some conditions.

Announcement of a movement which may lead to a nation-wide organization of truck operators.

Safety factors in design.

The Bus Transportation session brought out numerous comments from operators on present types of equipment. A. T. Warner, Public Service Corp., New Jersey, said that his company was fully convinced of the desirability of gas-electric buses for short-haul service due

to the tremendous amount of gear-shifting required in the ordinary gasoline bus.

In reply to a question as to how to meet the competition of jitneys and low-rate taxicabs, he declared that he had urged on manufacturers the need for comfortable and luxurious cars seating six to 12 passengers for special short services in which a comparatively high rate could be charged.

Speaking of long-haul operations, F. C. Murdock, California Transit Co., which is concerned in the transcontinental bus service, said that maintenance of schedules was of paramount importance for the operator, and that therefore where the route lay through mountainous regions a surplus of power was needed. The operator, he said, would be willing to have his costs raised one or two cents a mile if the requisite power was gained.

## Low Fare is Bus Attraction

Mr. Murdock observed that his company's investigation had tended to show that the most important factor in the patronage of long-distance bus lines was the saving over the railroad rate, and that overnight stops were seldom desired. He therefore was skeptical of the desirability of sleeper buses, as it was difficult to provide comfortable and adequate sleeping quarters without greatly reducing the carrying capacity and thus raising passenger-mile costs.

The old complaint that manufacturers sold motor vehicle equipment to irresponsible operators, to the detriment of established businesses, was again heard at

the Motor Haulage Session, at which G. W. Daniels, U. S. Trucking Corp., was one of the speakers. Alfred Reeves, National Automobile Chamber of Commerce, observed that restriction of sales was hardly a legal policy, and pointed out that fully to meet the demands of operators would seriously cut into the market for commercial vehicles.

Mr. Reeves urged greater cooperation on the part of operators, pointing out the benefits to manufacturers that had come through cooperative and declaring that if the operators were strongly united there would be less chance of unfavorable legislation and a much better opportunity for fostering favorable laws.

Truck manufacturers belonging to the National Automobile Chamber of Commerce consider better cooperation between truck owners so important that they have authorized a campaign to enlarge the membership of the Motor Truck Club of New Jersey, with headquarters at Newark, and to increase substantially the service it renders to members, Mr. Reeves announced. Plans for this campaign have been completed and it will begin immediately with Essex County as the starting point. If successful, the manufacturers have in mind extending similar aid to motor truck associations in other parts of the country.



A. F. Masury, who was chairman of the symposium on "Six-Wheel Vehicle Design vs. Legislation"

There was evidence that the demand continues for still greater speed in trucks. Comments by some manufacturing representatives indicated that the conflicting demands of operators are becoming a good deal of a problem, since the number and extent of the changes in models called for affects the ability of manufacturers to standardize and obtain quantity output for long enough periods to insure economical factory methods.

The symposium on highway legislation and the six-

wheel truck, participated in by Ethelbert Favary, Moreland Motor Truck Co., and Robert T. Hendrickson, Hendrickson Motor Truck Co., as well as others, brought out many claims from an operating standpoint for the utility of this type of vehicle. While not all the statements passed unchallenged, the main point at issue appears to be that states are being urged to legislate in favor of the six-wheel truck and are generally acceding to the demands.

T. H. MacDonald, chief, U. S. Bureau of Public Roads, pointed out that while many improved rural highways could carry, without damage, weights up to 8000 or 9000 lb. per wheel, this was not true of a large proportion of the highway mileage west of Missouri, and he felt that it was more important now to extend highway systems than to make present roads capable of sustaining maximum loads.

The conflict between the economic desirability of

heavy loads on a single vehicle and the need for not damaging roads, in Mr. MacDonald's opinion, could best be resolved by wider adoption of pneumatic tires and six-wheel trucks.

More information on parts from truck manufacturers was declared an urgent need in the report of one of the subcommittees of the Operation and Maintenance Committee, presented by J. F. Winchester. Said the report:

"There are certain ones who advocate that the manufacturers' chassis parts book, which accompanies each truck sold, cover in detail all the information it is necessary for an operator to have. According to my view, the manufacturer has done a very good work in getting out the chassis parts book; yet, on the other hand, no provision is made to give in this book an exact indication of the type of equipment supplied in any individual truck. For instance, if an operator breaks a side rail he cannot order it direct from the parts book without going to the trouble to measure the wheelbase of the truck.

#### Units Vary in Detail

"Various units for different classes of work, as is well known, vary in detail as regards the combination of gears placed in the gearbox, or in the rear axle. The parts book in no way indicates what combination is placed within a given unit. Equipment is sold in many instances along special lines. If it were possible to get an actual analysis of the special jobs that pass through any of the shops, it would be found that this percentage of business is very large; for there is no question at all but what the majority of the manufacturers are manufacturing to specifications, rather than manufacturing their own standard unit."

Air cleaners have reduced maintenance costs from 20 to 45 per cent and have extended the period between overhauls from 36 to several hundred per cent, according to E. C. Wood, Pacific Gas & Electric Co., who reported for a sub-committee of the Operation and Maintenance Committee. Questionnaires were sent to large and small fleet owners and fleets were selected which were situated in cities as well as isolated sections. Replies in general were favorable to the use of both air cleaners and oil filters.

Oil filters not only effect savings of oil but likewise increase the life of engines, in the opinion of several operators quoted by Mr. Wood. The change period of filter elements varies from 10,000 to 20,000 miles according to the make and type of filter used. Operators in isolated sections experienced difficulty in bringing about a regular exchange of cartridge or element at the proper time.

Some difficulty due to freezing of oil filters in northern sections was reported. This action is due to the presence of water in the crankcase oil and it resulted in some instances in rupturing of cartridges.

#### Conditions of Crankcase Oil

Means of determining the condition of oil in the crankcase as a guide in draining vary from laboratory analysis to determine deposits of silica, metallic particles and their oxides and oil characteristics such as acidity, viscosity, flash and fire, to mere inspection of samples of oil drained.

Oil has reached its limit of usefulness at a viscosity of 180 seconds Saybolt at 100 deg. Fahr. on the universal viscosimeter and should be drained at that point according to the result of an investigation of engine lubricants recounted in Mr. Wood's paper.

Donald Blanchard, Chilton Class Journal Co., contributed a paper on the manifold duties and responsi-



bilities which are the lot of the fleet superintendent.

W. E. Travis, California Transit Co., told of some of the mechanical problems on far western bus runs where the vehicle sometimes must go for two hours in first or second gear and cross areas of tremendous heat. This company designs its own equipment, and has adopted, to take care of carburetor troubles, the heat control recently put out by Hall-Scott Motors.

Air is drawn into the carburetor from outside the hood, and ordinarily the mixture is not heated, but when necessary for starting or in cool weather, the heat control allows of drawing the air for the carburetor through a stove built around the exhaust manifold.

#### Testing New Oil Filter

Most of the roads across the sparsely settled sections are still dirt and there is always a certain amount of dust which is drawn into the carburetors. Engine blocks, pistons and rings wear out very rapidly despite the use of cleaners. Mr. Travis is testing a new air-filter just developed by Hall-Scott. The screens in this filter are constantly being washed down with oil as the coach runs, carrying the dirt down and precipitating it into a collecting reservoir. The oily screens take out practically all of the dust, and are sufficiently large to permit unrestricted flow of air, so the adjustment of the carburetor is not affected.

Mr. Wood, at another session, declared that the necessary safety factors in the design of commercial vehicles to be the following:

**Brakes**—Pending the adoption by constituted authorities of a code for standard braking-ability, all motor-vehicles, except possibly motorcycles and heavy trucks, should be capable, by means of the service brake alone, of stopping in a distance of not more than 50 ft, from the speed of 20 m.p.h. on a dry, hard-surfaced road free from any loose material. The emergency brake should preferably be capable of producing the same result, but, as the absolutely minimum requirement, it should be capable of holding the vehicle on any grade it can ascend.

**Steering Gear**—Lost motion or play in steering gears should be limited to about 15 deg. The toe-in of front wheels should be watched.

**Lights**—Present lighting regulations should be more rigidly enforced as a necessary beginning in arriving at any improved night driving condition on the highways. Study of proper road illumination, combined with the minimizing of undesirable glare, should be given immediate further consideration with a view to determining whether it may not be possible to improve the regulations now in force.

#### No Red Except at Rear

Clear red should be used for tail-lights and the rear aspect of parking-lights, and its use should be prohibited for any other exterior light so located as possibly to be mistaken for a tail-light or parking-light. The use of colored lights on vehicles tending in any way to confuse the meaning of the customary safety-lights should be prohibited.

The location of spot-lights should be limited to the right of the vertical center-line of the vehicle, and the beam of the spot-light should never be directed to the left of the vertical center-line.

**Driver Vision**—Vehicle bodies and cabs should be designed with due regard to the necessity of reducing to the minimum shut-off of area of driver vision. The use of posters or other obstructions to vision on the front-windows or on the windshield should be avoided.

**Audible Signals**—All motor vehicles should be equip-

ped with some adequate audible signaling mechanism.

**Motor Vehicle Width**—The overall width of body, chassis and load of any motor-vehicle should be limited to 96 in.

Traffic problems were discussed in a banquet speech by Dr. Miller McClintock, director of the Albert Russell Erskine Bureau for Street Traffic Research. Mr. McClintock said that technical skill, formally represented in the Society of Automotive Engineers, has succeeded in developing automotive vehicles to a state of perfection which would have been beyond imagination even a decade ago; motor vehicles as produced today have potentials in load and speed capacity far beyond the capacity of the facilities over which they must operate.

This condition has served and will continue to serve increasingly as a handicap upon the efficient use of automotive vehicles until it is corrected. The inability of operators at the present time, under normal conditions, to utilize more than a fraction of the potential capacities of their vehicles results in tremendous economic losses. These losses are illustrated in typical city conditions where one finds commercial vehicles capable of efficient operation at 30 or more miles per hour, forced to operate at speeds which are scarcely in excess of that maintained by their horse-drawn predecessors; and by a snail-like operation at six miles an hour of

passenger vehicles with efficient operating speed up to sixty miles an hour. To the millions lost annually to the American owners of automotive vehicles through unused potentials must be added like millions in loss through unnecessary damages to equipment, and the tremendous social burden of more than 25,000 lives sacrificed annually.

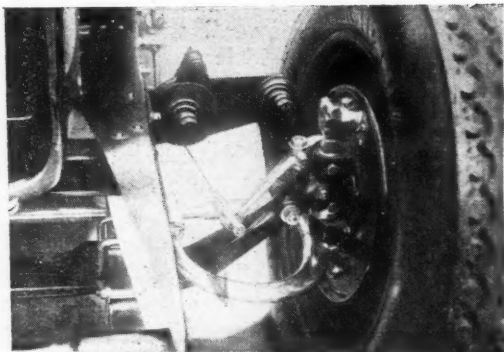
The construction of comprehensive systems of rapid transit highways in a number of the larger metropolitan



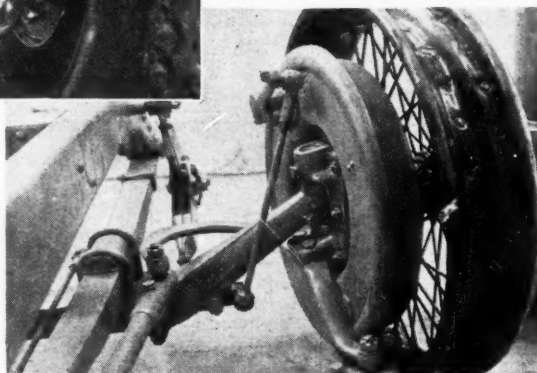
Dr. Miller McClintock discussed traffic conditions at the Transportation Meeting banquet

centers awaits only the conclusive proof of their justification. Indeed the proposal is no longer a visionary one, for at least in New York, Boston and Chicago specific plans to this end are already under way. The latter city in fact now possesses a magnificent example of super-highway construction, and one which is being rapidly extended. This is to be found in the outer drive where for considerable distances complete grade separation has been accomplished. Upon one of these routes it is now possible to drive from the Loop district outward for a distance of more than three and one-half miles at a comfortable and safe average speed of forty miles an hour. It requires no strain on the imagination to visualize the greater metropolitan centers of the not far distant future, provided with centrally located automotive terminal facilities, both commercial and passenger, connected with a system of rapid transit highways serving the entire metropolitan area, and reaching out to similarly protected express routes leading to other cities.





Above—Citroën steering, brake and shock absorber attachments.  
Right—Brake details of the Hotchkiss Six



# European Trend in to *Straight*

*Thirteen manufacturers en  
Others preparing to fol  
growing demand for*

By W. F.

**E**XCLUSIVE of Americans, there were 20 straight-eight engines at the recent Paris show. A few of these (Bugatti, Isotta-Fraschini, Panhard & Levassor and Ballot) have been on the market for some time, but the others are new. The makers producing them are Bianchi, De Dion-Bouton, Harris-Léon-Laisne, Morris-Léon-Bollée, Amilcar, Unic, Scap, Renault, Geneston, Mercedes-Benz, Messier, Horch and Praga. It is known that half a dozen other leading European makers have straight-eights in the experimental department, but were not ready to present them at this show; the movement, therefore, is one that will be continued.

No maker has attempted to bring the eight into the cheap production class, and no developments along this line are expected in the near future. In every case the object sought appears to have been a greater degree of flexibility to meet the growing public demand for better performance on high and smoother running.

## Small Piston Displacement

Several of the new eights are of very limited piston displacement, the majority of them being less than 183 cu. in. and the Amilcar having a displacement of only 120 cu. in., the bore and stroke being 2.40 by 2.95 in. This firm has specialized in the past on sporting-type cars of reduced size, but the design of the straight-eight appears to have been laid down to provide reasonable accommodation for four or five passengers in comfortable bodies. With a wheelbase of 115 in. and a track of 51 in., the car weighs only 2200 lb. with a four-passenger sedan body. At an engine speed of 4500 r.p.m., the road speed is 74½ m.p.h.

The Amilcar eight is an overhead camshaft job with vertical valves in a detachable head, the camshaft being driven from the rear by a double roller chain, with an idler sprocket bearing against the outer face to maintain the tension. The five-bearing crankshaft is nitrided, and the duraluminum rods are white-metaled direct. Water circulation is by thermo-siphon, with a fan driven off the front end of the camshaft. The chassis follows more or less standard lines, but the top of the frame is rather less than 13 in. from the ground.

The De Dion-Bouton eight, which obviously was designed by a man who had no connection with the firm before its reorganization, is also a small piston displacement job, the cylinders having a bore and stroke

of 2.52 by 3.81 in., giving a displacement of 152 cu. in. This is an overhead valve job, with a detachable head, pushrod operation, a nine-bearing crankshaft, and battery ignition through a Delco distributor. The engine has four-point rubber mounting on the frame, a vibration damper inside the crankcase, and a double oil pump having different pressures. One of the pumps circulates the oil through the main and the connecting rod bearings, to the camshaft and the timing gear, while the other pump, which is on the same shaft, delivers it to the flywheel, which is designed to act as a centrifugal purifier and filter. After passing through the flywheel, where it is cooled and freed of all metal particles, the oil goes to the bearings to supplement the main feed. A similar system of cooling and purifying the oil by circulating it through a hollow flywheel has been used for some time on a Chenard Walcker tractor, with very good results. It is found that the metal particles adhere so completely to the inner walls of the flywheel that they can only be removed by the use of a chisel. On the De Dion-Bouton no provision appears to have been made for opening up the flywheel to clean out the metal deposits.

The straight-eight brought out by the Unic Co. falls into the same general class as the De Dion-Bouton, and has been designed with the same performance in view—great flexibility, and a maximum road speed of 62 to 65 m.p.h. Cylinder dimensions are 2.48 by 3.94 in.,



General view of 1928 Paris Show. Cadillac, exhibits are in the im

# Car Design Veers Eight Type

ter new field at Paris Show.  
low soon. Aim is to meet  
better performance.

Bradley

giving a piston displacement of 152 cu. in. It is an overhead valve, push-rod type with a nine-bearing crankshaft, duraluminum connecting rods and aluminum pistons. The external appearance of the engine has been improved by fitting an aluminum housing around the fan belt. This housing continues the line of the cylinder block, and accentuates the impression that this is an overhead camshaft engine.

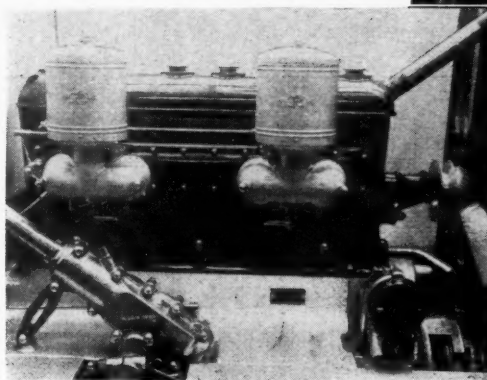
A feature of this chassis is the compound suspension. Long semi-elliptic springs are mounted under the axle, the forward end being pivoted to a bracket on the frame and the rear end shackled. Above the axle is a supplementary and shorter semi-elliptic spring, shackled at both ends. The lower spring assures suspension and the upper short spring takes extra load and eliminates rebound.

## L-Head Mercedes-Benz

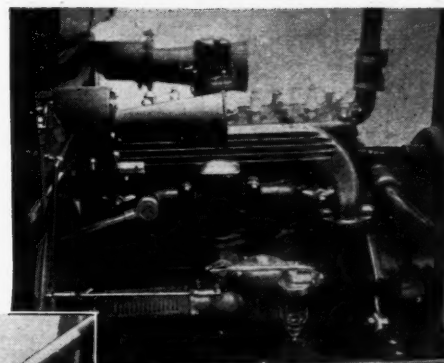
The first straight-eight to be produced by Mercedes-Benz is an L-head type of 3.15 by 4.53 in. bore and stroke, giving a piston displacement of 282 cu. in. The engine has a nine-bearing shaft, cylinders and upper half of crankcase in one casting, camshaft drive at the rear, and battery ignition with a distributor mounted on the rear of the cylinder block. The Zenith carburetor is on the right-hand side of the engine, the gas passage going through the cylinder block to the left side, where



Chevrolet, Dodge and Studebaker-Erskine  
mediate foreground



Above—The new Citroen  
four-cylinder engine.  
Left—Panhard & Le-  
vassor new six-cylinder  
engine with dual car-  
buretors



it is connected up to and heated by the exhaust manifold. Another new feature for this firm is the mounting of the water pump in the front end of the cylinder casting, with drive from the crankshaft by belt.

The Renault straight-eight is probably intended to replace the firm's 40 hp. six-cylinder model. The job is distinctive only by reason of the change of position of the radiator, which has added very considerably to the accessibility of the entire unit, and particularly the carburetor, generator, starter and centrifugal oil purifier.

A feature of the Omega straight-eight is an overhead camshaft driven by a vertical shaft and spiral bevel gears and mounted in nine bearings in an oil-tight casing above the valve chamber. Adjustment of the valves can be effected without touching the camshaft housing, by merely removing a plate on each side. The cams operate the valves through pistons guided in the bottom of the camshaft housing, while valve adjustment is direct on the valve stems by nut and lock nut.

Bugatti, who in the past has specialized on semi-racing straight-eights, with and without supercharger, has added a more normal model of 183 cu. in. piston displacement, with vertical valves in the head, operated from an overhead camshaft, and having a forged crankshaft with nine plain bearings, plain bearing connecting rods, high pressure lubrication and battery ignition. While it has the external appearance of his semi-racing types, silence and economy of production have been given attention.

## More Variety of Design

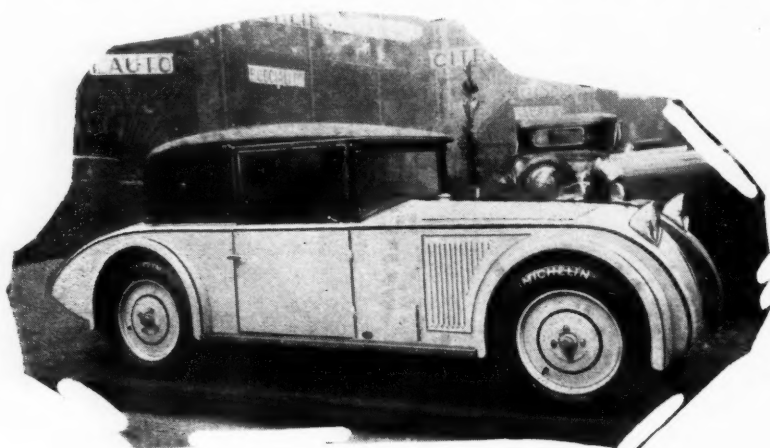
There is much more variety of design in the sixes than in the eights, for the former appeal to practically every class of user. Outstanding is the six-cylinder Citroen, an L-head job with four-bearing crankshaft, battery ignition, camshaft driven by double roller chain, cylinders and crankcase in one casting, combined belt-driven water pump and fan, four-point support on rubber blocks. With a four-passenger all-metal sedan body this is being sold at \$1,300 (including 12 per cent luxury tax). Because of its price and known value it is a model which is looked upon as a very strong competitor in the market.

Renault has two sixes, the smaller one, of 87 cu. in.,



selling at \$1,060, and the larger model, of 194 cu. in. being marketed at \$1,470, in each case with sedan body, and luxury tax included. Both these were in production last year and are being continued without much change.

Peugeot, who figures among the six biggest producers



*A Chenard-Walcker sports model developed from the 24-hour races at Le Mans*

in France, has a 122 cu. in. six selling at \$1,590 with a six-passenger sedan body. This model was in production last year, and is being continued with a lengthened wheelbase and four-speed transmission in place of three speeds.

Hotchkiss, one of the few firms in France having specialized on a single model, has added an 184 cu. in. six marketed at \$2,100 with five-passenger fabric leather sedan body. Laid out with a view to economical production, the engine is an overhead valve pushrod model with a seven-bearing crankshaft having a vibration damper, battery ignition and high pressure lubrication. One of the features of the new Hotchkiss is direct injection of oil onto the cylinder walls whenever the starter is operated. The oil pump is mounted on the electric starting motor shaft, and injects through internal oil leads in the cylinder casting. It is claimed that this oil injection prevents wear of the cylinder walls and pistons, which is highest during the few minutes after starting up.

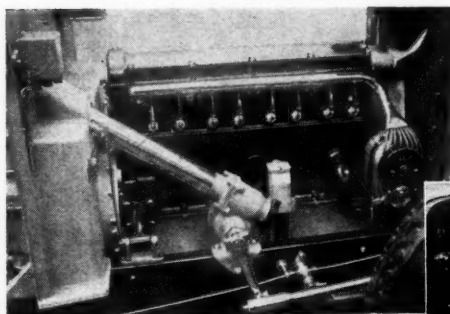
Fiat has gone almost entirely to a six-cylinder program, the only exception being a small car of 7 hp., with a four-cylinder engine of 60 cu. in. piston displacement. Three of the sixes, of respectively 137, 153 and 228 cu. in. displacement, have been laid out particularly with a view to low production cost, and embody such features as cylinders and crankcase in one casting, seven-bearing shaft, combined water pump and fan, vibration damper, sheet metal oil pan, battery ignition, oil purifiers. They have Hotchkiss drive, Fiat's own type of four-wheel brakes, and an American appearance in the general lines of the body, which are of metal construction and lacquer-finished.

Among the sixes having features is a sports model of the 122 cu. in. Itala, with two overhead camshafts driven by a train of helically cut gears at the rear. The final pinion on the train is of Celoron and is

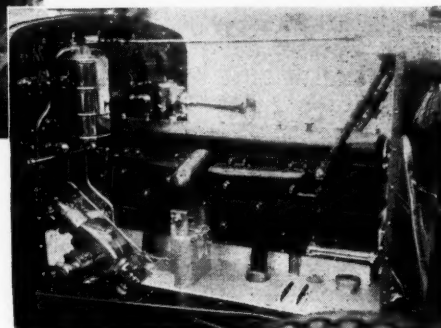
mounted on the intake camshaft; a smaller pinion on the same shaft meshes with the exhaust camshaft pinion. This engine has the cylinders and crankcase cast of aluminum, with steel liners pressed in, and a detachable iron head. A chassis feature is that the axle tubes pass through the frame members, and the torque tube is above the cross-frame members.

Rubber mountings between engine and chassis are being used by an increasing number of makers. There is an increased use of double roller chains for camshaft drive, among those having adopted this being Citroen and Amilcar. Practically all engines now have an oil purifier, this generally being a proprietary make; a few use their own make of purifier. Oil radiators are used on only a few high-grade cars, among them being Rochet-Schneider, Peugeot and Chaigneau-Brasier.

Battery and coil ignition has made immense headway, at the expense of the magneto. In such cases the starting and lighting equipment is usually of European manufacture, but



*Above—Straight-eight Amilcar with overhead camshaft driven by chain from the rear*



*Below—Straight-eight Unic with overhead valves and pushrods. Fan belt inclosed*

the distributor is nearly always American—Delco or North-East. Single unit electric generators and starting motors show a slight increase over two units. For all but small cars the direct-gear starting motor running at engine speed is likely to be insufficient, and the S.E.V. Co. has introduced a reducing gear which engages automatically when the apparatus is used as an electric motor, giving a reduction of 8 to 1. In some other cases of direct drive starting motors, use is being made of 24 volts for starting and 12 volts for lighting and other uses on the car. This is not very general, however, and some electrical firms hold the opinion that the move will be rather toward 6 than to 24 volts.

### Two American Engines

The only examples this year of European cars fitted with American engines are the Guyot, supplied with a Continental, and the Sizaire Freres, engined by Willys-Knight.

Few changes have been made in clutches and transmissions. Voisin and Berliet are marketing an auxiliary speed reduction, mounted on the forward end of the torque tube and giving two gear ratios. On the Voisin the normal gear reduction is 4.7 to 1 and the low ratio 6.7 to 1. A feature of the Voisin is that



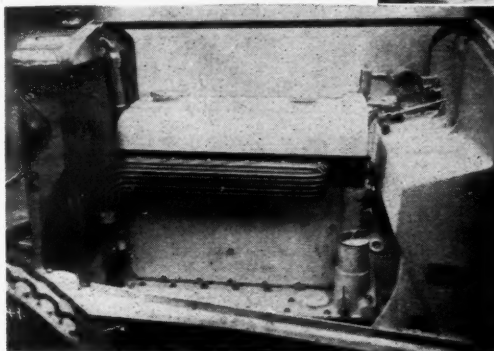
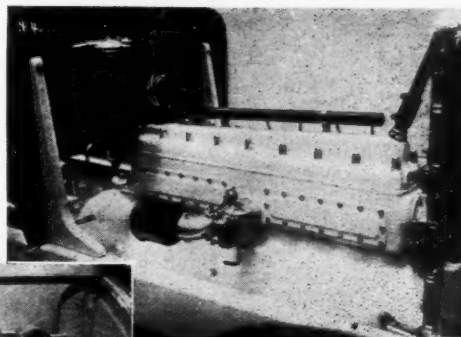
the vacuum in the induction pipe is made use of to engage either of these gears. Mathis has a silent third of the internal gear type, operated through the standard type of gear shift. Panhard & Levassor has also produced, on a new 122-in. six-cylinder model, a silent third of the constant mesh pinion type, the pinions being cut helically.

There are three front-wheel drive cars in the show. These are the Tracta, a small job with an engine of about 68 cu. in. piston displacement, the Chaigneau-Brasier, with a straight-eight engine of 183 cu. in., and the Bucciali which makes use of the De Lavaud automatic transmission. The Tracta construction comprises two horizontal bars in the same vertical plane, the ends of each upper bar carrying a cylindrical steering head. There is a double universal joint in each axle shaft, and each front wheel is sprung independently. On the latest model the brake drums are mounted close to the differential housing, which is ahead of the radiator. A sheet metal apron covers the whole of the front drive mechanism lying between the frame members in front of the radiator.

The Chaigneau-Brasier, which has just been produced, has an eight-cylinder engine, clutch and gearbox in one unit with three-point attachment to the chassis. The four-speed transmission is entirely ahead of the radiator, and the transverse axle shafts are between the clutch and the transmission. An almost normal type of I-section front axle is used, with the portions outside the spring seats considerably strengthened and terminating in an eye in which the stub axle and universal joint are mounted. An air pump for tire inflation is driven off the transmission, access to this being obtained by lifting the apron. A combined generator and starting motor is mounted on the end of the crankshaft.

Independently sprung front wheels have not made any progress, those shown being makes which were at the exhibition a year ago. They are the Harris-Léon-Laisne, Sizaire Freres, Cottin & Desguottes, Tracta, De Lavaud and Bucciali. There are no new developments in duplicate steering, all those in the show having

Right—Mercedes-Benz straight-eight engine. Carburetor is on right-hand side and passes through cylinder block to intake manifold on valve side



Left—Double overhead 122-in. engine in sports model Itala

been exhibited at Paris and other shows a year ago.

Centralized chassis lubrication systems are far from being general, but they are increasing. A rival to these oiling systems is the Silentbloc rubber bushing, which is being used for spring shackles and also for engine mounting, among the firms having adopted it being Delage, Unic, Chenard & Walcker. In some cases where front springs have Silentbloc bushings the portion of the spring carrying the eye is short and is riveted to the end of the main leaf; the second leaf encircles the eye.

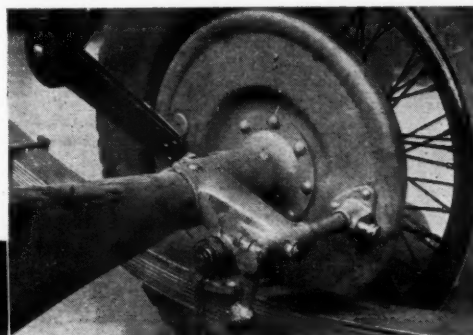
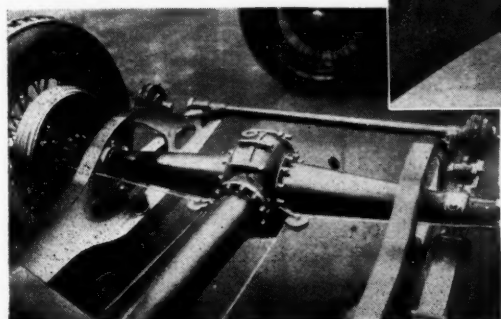
#### Following American Practice

American competition is undoubtedly responsible for the fillip which has been given to body design and construction. European bodies have very much brighter colors, more pleasing lines and undoubtedly are better finished than those of a year ago. This development has its influence on fabric leather construction, and the fabric leather body now is hard to distinguish from the rigid type.

Weymann, who has led in this field, has changed his design, and instead of making every part flexible, he is treating the body as three or four rigid units, united flexibly one to the other. As an example, the doors were formerly assembled with angle irons, with a gap between the wood to prevent squeaks, the finished job being an entirely flexible door. Now the door is rigid, and is an ordinary coach-builder's job, but is mounted on flexible hinges adjustable for height by means of a nut on the top and bottom of the hinge pivot. By treating the body in this way as big rigid units assembled flexibly, greater freedom is obtained in lines and a more extensive use can be made of moldings, which are of wood, covered with fabric leather.

There is a strong tendency to eliminate the valance by bringing the body panels practically down to the level of the running board, thus avoiding any break in the lines.

Below—Rear axle passes through frame on sports model Itala



Above—Hotchkiss Six spring anchorage to axle housing

# Use of *Magnesium* Gradually in Automotive Field

*Lightest commercial metal will probably find greatest application in airplane work although it is now used for various car and motorcycle parts.*

**M**AGNESIUM, at present the lightest commercial metal, is gradually finding various applications in the automotive industries. The best chances for its use naturally lie in the building of aircraft, for it is in that particular branch of our industry that weight reduction counts for most. Indeed, magnesium parts are already being used to quite an extent in aircraft engines and aircraft engine accessories.

Magnesium is really a great deal lighter than aluminum, and if it should be found possible to produce alloys consisting chiefly of magnesium that would equal aluminum alloys in other ways, particularly with respect to mechanical properties and resistance to corrosive influences, they would certainly be widely used. As compared with a specific gravity of 2.67 for aluminum, that of magnesium is only 1.74. The same as aluminum, magnesium is used for mechanical purposes chiefly in the alloyed form, and a considerable number of different alloys have been developed, one of the principal alloying elements being aluminum. Copper is used as an alloying element for magnesium used in pistons, while manganese is sometimes added in small proportions to increase resistance to corrosion.

Automotive engineers are interested in light metals and alloys chiefly from the standpoint of their possible use in the reciprocating parts of high-speed engines, the pistons and connecting rods, for the reason that a saving of 1 lb. in the reciprocating weights of these engines is equivalent to the saving of many pounds in the structural parts and covers. This is due to the fact that a lightening of the reciprocating parts results in a reduction of bearing loads, which in turn permits of increased speeds and powers.

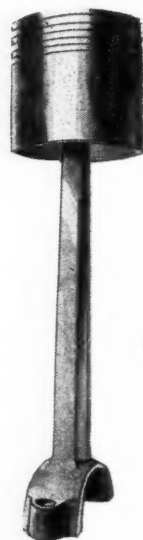
The first magnesium pistons were cast either in sand or in metal molds, and the cast mater-

ial did not have the proper grain structure, hence the wear characteristics left a good deal to be desired. When considered as a piston material, magnesium, together with aluminum, also suffers from its high coefficient of heat expansion. In the case of aluminum alloys this disadvantage was overcome, at least partly, by severing the piston skirt from the upper part of the piston by means of a horizontal slot. This same plan could not be followed in connection with magnesium pistons, because of the greater softness and lower elastic limit of the material. If made of the same skeleton form as modern aluminum pistons, the magnesium piston easily becomes permanently deformed.

The magnesium piston apparently is at its best in the smaller sizes where the excess in expansion of the piston over that of the cylinder does not give the same trouble from piston slap in the cold condition, and oil pumping and possible seizure in the hot. Two prominent manufacturers of motorcycles — Indian Motorcycle Co. and Harley-Davidson Motor Co.—have been using magnesium alloy pistons in some of their motorcycle engines with success for years.

Indian Motorcycle Co. is using pistons of Dowmetal, a magnesium alloy produced by the Dow Chemical Co. of Midland, Mich., in the engines of its racing motorcycles. Previous to the adoption of magnesium, an aluminum alloy was used for these pistons. When magnesium was substituted the thickness of the piston walls were considerably increased, in order to increase the heat conductivity and thus make it possible to use higher compression pressures. In consequence, the magnesium pistons are no lighter than those of aluminum, but, as a result of the higher compression, the engine power was increased.

As regards wear of magnesium alloy



**T**HE earliest attempts to make pistons of magnesium alloys were not uniformly successful, and something like a set-back was suffered. But if we go back in automobile history a little farther we find that the same thing occurred in connection with the use of aluminum for pistons.

At first the aluminum piston made rapid headway; then, after a year or two, a good many firms returned to cast iron, but finally the development of the split-skirt and the invar-strut types of piston overcame the early difficulties and aluminum pistons became very popular. It is thus not at all improbable that after some farther development the difficulties which have attended the use of magnesium for pistons in the past will be overcome.



# Increasing

By  
P. M.  
Heldt

pistons, experiences have been rather at variance. In some instances the pistons have stood up very well, while in others their life has been quite unsatisfactory. In pistons we have two principal wearing surfaces, viz., that of the piston skirt, which bears against the cylinder wall, and the sides of the ring grooves. It is well known that the ring grooves give some trouble even in the case of aluminum alloy pistons, their more rapid "wear" being no doubt due to the greater softness of aluminum alloys as compared with cast iron. With cast magnesium alloy pistons, we understand, this trouble is aggravated, and whereas in some instances the skirt wear was no greater in magnesium pistons than in the aluminum alloy pistons which they replaced, the groove wear was more rapid.

In the above the term "wear" is used in the sense of loss of diameter or width of "wearing part" and not as equivalent to abrasion. What is referred to as "wear of ring grooves" is evidently not the result of abrasion, but of a hammering action. The Dow Chemical Co. in reference to this subject of "wear" states that with the early cast pistons a slight change in form took place both at the skirt and the ring grooves, due to the malleability of the material, particularly at piston operating temperatures. Hammering-out of the ring grooves was largely eliminated in cast pistons by subjecting the grooves to a rolling operation which resulted in a small amount of surface working, the latter preventing subsequent hammering by the ring.

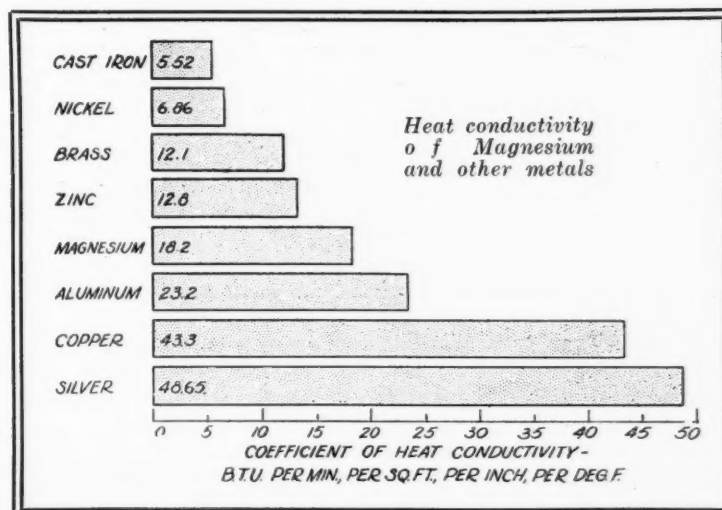
Harley-Davidson Motor Co. at present is using magnesium alloy pistons in one of its standard models, the 45 cu. in. engine, and is also furnishing them as special equipment on two other models, of 61 and 74 cu. in. displacement. Following is a comparison of weights of pistons of different materials as employed by Harley-Davidson in current models:

Table I—Weights of Pistons in Ounces

Model and Cyl. Bore	Cast Iron	Aluminum	Magnesium
JD, 3 7/16 in.	21.5	15	11.75
F, 3 5/16 in.	19.0	14.5	11.5
D,	15.5		6.75

Magnesium alloy pistons are now produced by a press-forging process, and the complete mechanical working of the entire mass of metal is said to largely eliminate the hammering-out effect on both the skirt and the ring groove. This forging process will be dealt with in some detail further on.

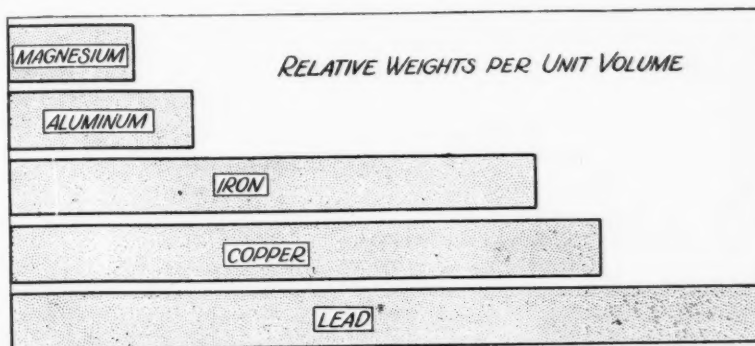
Magnesium has been used for mechanical purposes in Europe longer than in this country and a series of alloys known as Elektron, made by the I. G. Farbenindustrie, A. G. (German Dye Trust) has had a considerable vogue. Castings of Elektron were first publicly exhibited at the international aviation show in Frankfurt-on-Main in 1909. These



alloys are now furnished in the form of castings of all kinds, rods, profiles, tubes, wires, drop forgings, pressings and sheets. The alloys therefore are comparable to iron and steel in respect to the variety of forms in which they are marketed and used.

Elektron alloys melt at around 1200 deg. Fahr., or at about the same temperature as commercial aluminum alloys, a fact on which special stress is laid by the producers, who state that they have had to overcome considerable prejudice on the part of possible users who previously had known magnesium only as flashlight powder and considered it an inflammable material. In the cast form one of the alloys has an elastic limit of about 7000 lb. p. sq. in., an ultimate strength in tension of 25,500-31,000 lb. p. sq. in., and elongation of 6-10 per cent, a contraction of area of about 10 per cent, a transverse strength of 25,500-31,000 lb. p. sq. in., and a Brinell hardness of 43-47. The modulus of elasticity of Elektron in the different forms lies between 5,700,000 and 6,500,000 lb. per sq. in., being lowest for cast samples. Some of the pressed forms show much higher mechanical properties, one having an elastic limit of 23,000-28,000 lb. p. sq. in., an ultimate strength of 40,000-45,000 lb. p. sq. in. and a Brinell hardness of 50-55. One of the alloys can be hardened, and in that form shows an elastic limit of 33,000-35,000 lb. p. sq. in., and an ultimate strength of 54,000-60,000 lb. p. sq. in. In this form the elongation is 2-5 per cent and the contraction of area 3-6 per cent. It is pointed out that the mechanical properties given for pressed parts apply only where the mechanical work done on the specimen has been sufficient, that is, in rods up to 2 in. diameter and corresponding profiles, the values being somewhat smaller for larger sections.

Where lightness is the chief consideration, for parts under plain tension, the respective merits of different materials are given by the ratios of their tensile





strength to their specific gravity, but for beams or struts the comparison is not so simple. This subject was investigated by Prof. A. Baumann of the Technical College of Stuttgart, who discussed it in an article in the 1925 edition of the Yearbook of the German Automobile Manufacturers Association entitled "A Comparison of the Mechanical and Weight Properties of Materials."

#### Bending Stresses

As regards bending stresses Prof. Baumann found that the criterion of merit is the value of the expression  $g/S^2$ , where  $g$  is the specific gravity of the material and  $S$  its transverse strength, the weight of the part being proportional to this value. It is assumed that the general design of the part is in all cases the same, whatever the material of which it is made. Where the materials are used as columns or struts, their respective merits are indicated by the values of the expression  $g\sqrt{E}$ , where  $E$  is the modulus of elasticity. On these bases, cast Elektron under bending stresses has a weight index of 11 as compared with 16 for silumin (an aluminum silicon alloy), 26.5 for an aluminum-copper alloy and 32 for cast iron. Under column-loading the weight index for cast Elektron is 2.6 as compared with 3.1 for an aluminum-copper alloy and 7.9 for cast iron. Rolled Elektron under bending stresses has a weight index of 9.4 to 7.8 as compared with 11.5 10.0 for duralumin and 31.4 for wrought iron, while under column stresses Elektron has a weight index of 2.8-2.6 as compared with 3.1 for duralumin and 5.5 for wrought iron.

Pistons of Elektron alloy have been used successfully in many of the most important automobile contests in Europe in recent years. For instance, a 10-40 hp. NAG racing car with which Riecken established a new world's 24-hour record on the Monza (Italy) racing track in 1924, at an average speed of 66.6 m.p.h., was fitted with Elektron pistons, as was the Alfa-Romeo of Ascari which won many races that year. The Benz-Gaggenau and Mannesmann trucks which went successfully through the first Russian endurance contest of 3100 miles were equipped with pistons of the same material. Such pistons have long been used in omnibuses of the Marlin General Omnibus Co.

#### Grain Structure Improved

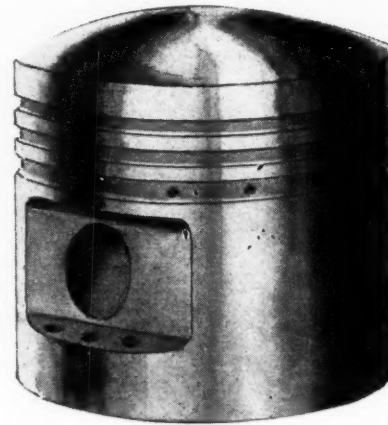
It is understood that the success of magnesium alloy pistons in Europe is largely due to the fact that these pistons are forged or pressed hydraulically (that is, mechanically worked) whereby their grain structure is improved. The forging method has been taken up also in this country, and the Dow Chemical Co. reported more than a year ago that it had developed a method of forging Dowmetal pistons whereby the properties of the alloy were greatly improved. The piston was formed in the first place by casting. A steel core was then made to fit the inside of the piston and the latter therefore could be mechanically worked either by hammering or pressing or by a combination of both methods. It was found that the pistons must be worked hot and held within rather close temperature limits while being worked.

The process has since been greatly improved. At the present time large magnesium alloy ingots are extruded into round stock of approximately the same diameter as the finished piston. This is cut into lengths and these solid blocks of metal are then press-forged into pistons. The extrusion process completely works the metal, and the latter is then completely reworked during the forging of the piston. It is obvious that by this new process the material is subjected to much

more mechanical work than by the earlier process as described above.

Alloys of the aluminum group possess advantages for internal combustion engines not only by reason of their low specific gravity but also on account of their high coefficient of heat conductivity, which results in cooler piston heads and permits of increased compression ratios. It is therefore of interest to know how magnesium alloys compare with aluminum alloys with respect to heat conductivity. Magnesium is not quite as good a conductor of heat as aluminum, its coefficient of heat conductivity being given as 134 as compared with 175 for aluminum (calories per hour per centigrade

degree for a cube of one meter). These coefficients, of course, are based on equal volumes of the materials. On the basis of equal weights magnesium is in the advantage. Laboratory tests made by Prof. Gabriel Becker of the Charlottenburg Technical College with pistons of different materials showed that the temperature difference between the circumference and the center of



Forged magnesium piston  
for airplane use

the piston head is least with magnesium, slightly greater with aluminum and greatest with cast iron. The temperature at the center of the piston was far greater in the case of cast iron pistons than will either of the light alloys. Presumably the magnesium pistons had a greater volume of metal in the head.

Owing to the high coefficient of heat expansion of magnesium it is well to fit piston pins more tightly than in the case of cast-iron pistons. In Germany it is the practice to heat the pistons in a bath of oil or with a gas flame before the pins are pushed in place by hand. The piston pins are not fixed either in the piston bosses or in the connecting rods, but are allowed to float, and plugs or buttons of soft metal are fitted into the ends of the hollow pins to prevent them from scoring the cylinder bore. Owing to the relative softness of the magnesium alloy it is well to make the pin diameter somewhat larger than in the case of cast-iron pistons. Starting with a pin diameter of one-fourth the cylinder bore for a bore of 2 in., the ratio is increased and becomes about one-third for a bore of 3½ in. The object of this practice is, of course, to keep down the specific pressure on the bearing surfaces of the piston bosses.

As regards the coefficient of heat expansion, it is of about the same order for magnesium alloys as for aluminum alloys. The coefficient of heat expansion for Elektron, for instance, lies slightly below that of the usual aluminum-copper alloy but quite a little above that of the aluminum-silicon alloy Silumin. This coefficient is not a constant but increases with the temperature.

Magnesium, as already pointed out, appeals most strongly to the aircraft engineer. Unfortunately at present it cannot be utilized for seaplanes, as when unprotected it is rapidly attacked by salt water and salty air. It is not to be supposed, however, that this diffi-

culty is insurmountable. The problem of protective coatings is receiving serious study and we understand that the United States Navy, which heretofore has been squarely opposed to the use of the metal in its planes, is assuming a more favorable attitude, having found that by suitable protective treatment the alloys can be made to stand up quite well under sea-coast environments.

Aside from the use of magnesium for pistons, which has been discussed at length in the foregoing, perhaps its most noteworthy use is in the rotors of Roots-blower-type superchargers. As is well known, these rotors are of the general form of a figure 8, and in order that the blower may operate efficiently at all speeds it is essential that it should not change its shape materially under the effects of centrifugal force. The American Magnesium Corp. has made a number of castings for such rotors of its AM4-4 alloy, which contains 4 per cent of aluminum, 0.4 per cent of manganese and 95.6 per cent of magnesium. This alloy is said to be quite suitable for general casting work, combining attractive physical properties with very good non-tarnishing properties.

#### Roots Blower Housings

It has been suggested to use magnesium also for the housings of Roots blowers as the castings are denser (less porous) and therefore more nearly air-tight than those of aluminum now commonly used.

The Curtiss Aeroplane & Motor Co. has used magnesium castings in its engines for several years and has standardized on magnesium alloy for such parts as oil-pump housings, gear housings, brackets, and cover plates.

Another stable commercial use for magnesium castings is in the construction of inertia starters for aircraft engines. The Eclipse Machine Co. of East Orange, N. J., is using magnesium castings on all of its electrical equipment for Army work and on a large proportion of its equipment for commercial work. It will serve as an indication of the scale which the use of magnesium in this field has attained to mention that the Aluminum Corp. of America during the first eight months of the current year supplied castings in the neighborhood of 10,000 lb. to the Eclipse company. The Pratt & Whitney Aircraft Corp. also is trying out a number of magnesium castings on its engines.

The Magnesium Corp. of America recently succeeded in hammer-forging aircraft propellers of its AM4-4 alloy, and eight of these forged magnesium propellers have been delivered to Wright Field. The physical properties of this material were as follows: Tensile strength, 34,000 lb. p. sq. in.; yield point, 22,000 lb. p. sq. in.; elongation, 6 per cent.

#### Army Specifications

The U. S. Army Air Service has issued specifications (No. 11,301) for magnesium alloy castings which are said to be suitable for cover plates, casings, housings and similar parts. The Air Service requires a minimum magnesium content of 85 per cent, a maximum specific gravity of 1.85, a minimum tensile strength of 20,000 lb. p. sq. in., an elongation of 4 per cent in 2 in. and a Brinell hardness of 40-50. Several parts of aerial cameras and the housings of aircraft engine starters are among the most important magnesium alloy castings currently used in aviation.

In the field of automobile accessories magnesium has found application to the resonator disks of vibrator type electric horns. The Dow Chemical Co. makes these resonator disks by a coining process at the rate of a couple of thousand per day. It is claimed that

these magnesium alloy disks give a clearer and more resonant tone than any other suitable material.

The saving in weight made possible by the use of magnesium alloys has appealed even to designers of motor buses, and several parts of the Versare bus are made of it. In Germany the Berlin General Omnibus Co. is using Elektron wheels. In a talk before the Mid-European Motor Vehicle Association on Nov. 12, 1926, the technical director of that company, Dipl.-Ing., Quarg, said that cast wheels of Elektron had proved entirely satisfactory and would be used exclusively in the future. By the use of suitable forms the weight of the wheels could be reduced, as compared with cast steel, almost in the proportions of the specific gravities. Even in the case of the wheels, which are subjected to heavy shocks, the weight was reduced in some cases to 35 per cent, which for all four wheels meant a saving of 510 lb.

The use of magnesium alloys on commercial vehicles would depend largely on the cost at which they can be produced. At present the cost is high because the scale of production is low and the small production has to bear the cost of considerable development work. It is said that the raw materials from which magnesium is produced are available in great abundance and that if there should be sufficient demand there is no reason why it could not be manufactured as cheaply as aluminum, on a volume basis.

The higher cost of the metal is offset to a considerable extent by its excellent machining properties.

## Data on British Industry

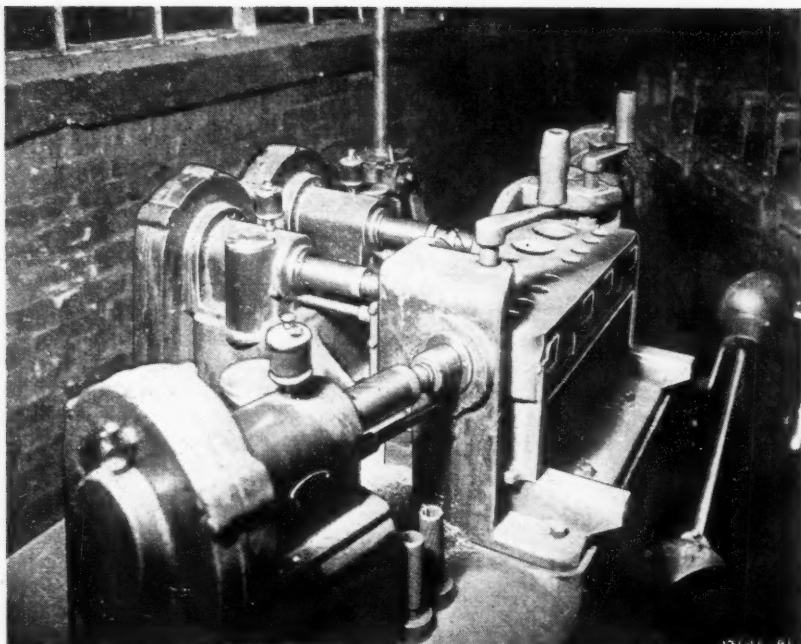
THE third annual edition of "The Motor Car Industry of Great Britain," which made its appearance at the time of the opening of the Olympia show, states as regards the shows of passenger cars which have been held in London fairly regularly each year with the exception of the war years, that the number of exhibitors increased from 309 in 1907 to 533 in 1927, and the number of paid admissions from 74,855 to 275,222.

The proportion of the cost of road building and road maintenance which is paid out of the road fund increased from 18 per cent in 1920-21 to 43½ per cent in 1924-25, the actual contribution from the road fund to the expense of road maintenance having increased from about six million pounds in 1920-21 to about 14½ million pounds in 1924-25.

As the number of motor cars on the roads has increased there has been an increase also in the number of accidents involving motor vehicles. However, the number of accidents per year per hundred vehicles has been nearly stationary at five during the last seven years, while in 1919 the number was above 10. By far the majority of the people traveling over the roads of Great Britain do so in private motor cars, these making up 78½ per cent of the total number of road travelers; buses account for 10½ per cent, pedal cycles for 7 per cent and charabans (sightseeing cars) for four per cent.

It is figured that if an annual income of between £400 and £2,000 justifies ownership of one car and an income of over £2,000, ownership of two cars, the number of potential car owners in Great Britain is between 950,000 and 1,000,000, and already there are 900,000 car owners in the country. Means will probably be found, however, as time goes on, to make it quite possible for people with incomes of less than £400 to own a car.

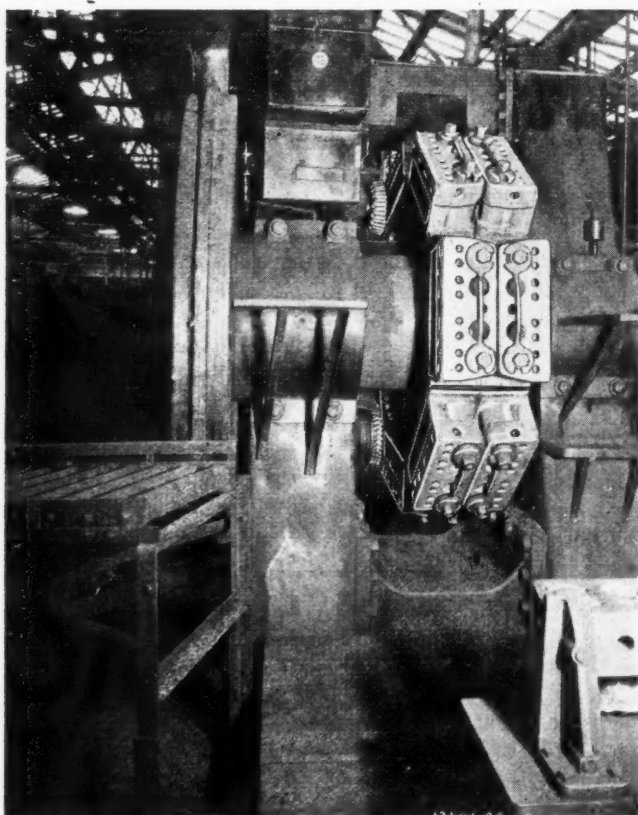




*A special three-way machine is employed to counterbore four Welch plug holes in the cylinder block*

A NUMBER of interesting operations, employing tools and fixtures not generally used for this work, are to be found in the cylinder block department of the Cadillac Motor Car Co.

After the preliminary inspection of the casting, and water test for leaks, the rough block is mounted in a drum-type milling machine where the top and bottom surfaces are rough and finish-milled. The work-holding fixture of this machine holds eight blocks which are located by means of the points used by the foundry in checking the casting.



From this milling machine the blocks pass to a grinding machine fitted with a magnetic chuck where the bottom surface is ground. Location is made from the milled top surface and the bottom surface is ground primarily to provide an accurate surface for locating in the next machine—a drill press—where four locating holes, one in each bottom corner, are drilled, along with all the other holes in the bottom surface.

The four locating holes are then reamed in a drill press and three oil drain holes in the bottom surface are counterbored in another drill press equipped with a seven-spindle drill head.

Four Welch plug holes are counterbored in a special three-way machine and the blocks then pass to a large drum-type miller where the manifold face is rough and finish-milled. This machine is fitted with a work-holding fixture carrying 14 blocks, two abreast, and both rough and finish cuts are taken during their progress around the machine.

For this operation all four locating points are employed and the blocks are held down by means of pilot clamps passing through the two end cylinder bores. For operations where less strain is imposed upon the block during machining, only two of the locating points are generally used.

The first rough boring operation is performed in a four-spindle hydraulic boring machine and in this operation the bores are held to 0.004 in. tolerance in diameter and straightness.

The second rough bore follows immediately in another four-spindle boring machine. The webs provided in the casting about the cylinder bores to add strength then have a radius milled in them in a drill press.

Three drilling operations follow. In the first a 1 in. pipe tap hole is drilled and tapped; in the second, holes in the manifold face are drilled; and in the third, all the holes in the top surface are drilled in a hydraulic machine equipped with a 56-spindle fixed-center

*A large drum type milling machine with fixtures to hold 14 blocks is used to mill manifold faces. Two cutters work on each block to take both rough and finish cuts. The roller conveyor is part of a complete system which eliminates all handling of the blocks between machine operations*

## Same Reamer All Bores Cylind

Uniform size of bore  
to perform more ac  
details in produ

By K. W.



# Used to Machine in Cadillac der Blocks

obtained, which makes it possible curate honing operation. Other ction system are described.

## Stillman

drill head which insures the utmost accuracy in the spacing of all these holes.

Valve holes are rough bored and faced in two operations in four-spindle drill presses. In each operation every other valve hole is worked on, thus providing sufficient space for the large boring bar collars required to give the necessary rigidity. All eight valve holes in the block are finish-bored in an eight-spindle drill press, the boring bars being equipped with tools which spotface for the valve guide holes.

The eight valve guide holes are then drilled in another eight-spindle drill press and in still another similar machine all eight valve holes are semi-finish bored and faced and the valve guide holes are rough reamed.

One more operation in another eight-spindle machine finish bores the valve holes and semi-reams the valve guide holes, after which the intake ports are drilled. The breather pad is then milled and the holes in it are drilled and tapped. The cylinder barrels are then chamfered in a drill press.

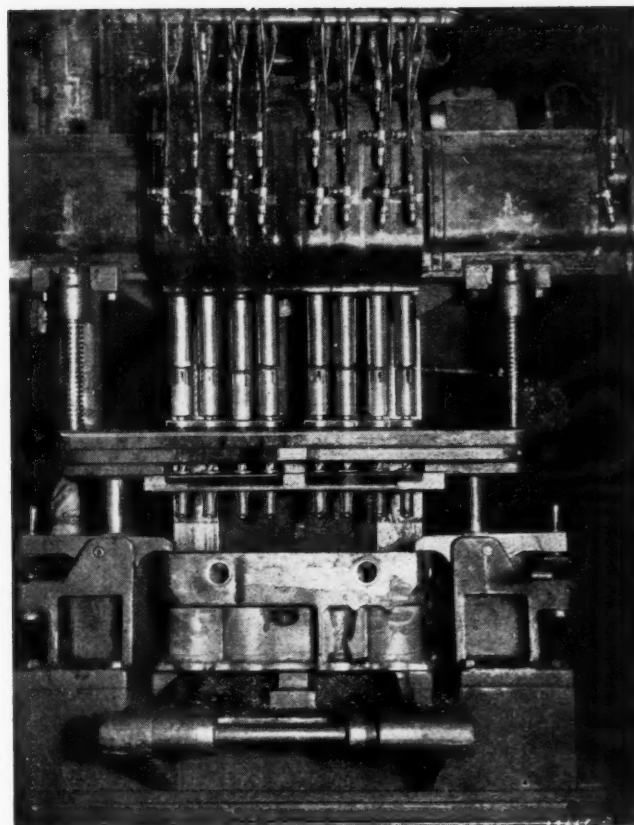
A number of drilling operations follow, one drill press being utilized for drilling 12 holes in the barrels, another for drilling 12 more holes in the barrels, and a third for drilling and tapping three holes for the breather shroud. The holes in the manifold face are then tapped in a radial drill press.

The valve spring seats are spot-faced in an eight-spindle drill and then, in another radial drill, the stud holes in the top face are countersunk.

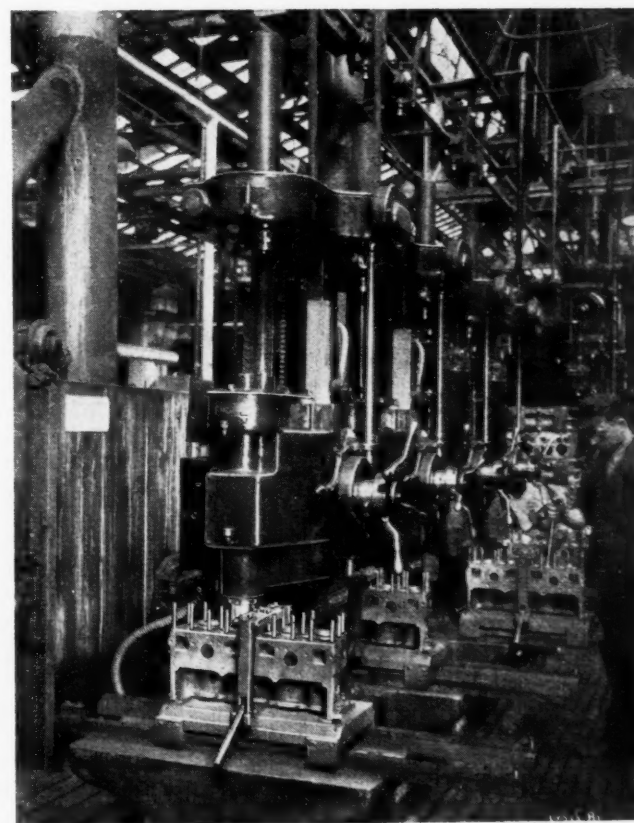
The reaming operation on the cylinder bores, which occurs after the studs are assembled and the block inspected, is performed in special four-spindle gang drills which have the spindle heads turned at 90 deg. from the conventional type of machine. The cylinder block is loaded at the front of the machine in a sliding fixture which is indexed toward the back, one bore being reamed at each index.

By using the same reamer to machine all four bores in each cylinder block, a uniform size of bore is obtained which makes it possible to perform a more accurate honing operation even though the honing is done in a multiple-spindle machine.

Finished diameters of the cylinder bores are held within tolerances of 0.0015 in. Out-of-round and taper can not be more than 0.0005 in., while the squareness of the bore with the bottom surface of the block must not vary more than 0.001 in. in the length of the bore.



*An eight-spindle drill press is employed for finish boring valve holes. Rough boring is performed in two operations in four-spindle machines so that greater rigidity for the spindle can be provided. Valve guide holes are also spotfaced in the finish boring operation.*



*In final reaming operations the same reamer is used to ream all four bores in each block.*

# Gear Association *Finishing* Work on *Steel* Specifications

Standards for forged and rolled carbon steels for gears are ready for approval by letter ballot. Progress reported on many other items at recent Buffalo meeting.

AT the meeting of the American Gear Manufacturers Association held at Buffalo, Oct. 11-13, reports were received from numerous sub-committees of the Technical Standards Committee, and the status of the work of gear standardization was reviewed in reports of the General Standards Committee, of which B. F. Waterman is chairman, and of the Sectional Committee on Gearing of the American Engineering Standards Committee.

In the report of the Sectional Committee on Gearing it was stated that there had been no marked activity the past year, but three sub-committees had produced work for distribution and discussion. The Tooth-Form Committee formulated a proposed standard for  $14\frac{1}{2}$  deg. and 20 deg. full depth in volute teeth. The Committee on Bevel and Spiral Bevel Gears submitted certain material of which a redraft had been prepared and submitted by Chairman F. E. McMullen. The Metallurgical Committee had been particularly active, and its proposed American standard specifications for forged and rolled carbon steels for gears had passed entirely through the sectional committee and were now in the hands of that committee for approval by letter ballot.

## Non-Metallic Gearing

F. C. Roantree, chairman of the Non-Metallic Gearing Committee, reported that while the committee had not taken any definite steps toward the preparation of new standards, as the result of tests being carried out on the Lewis machine at Massachusetts Institute of Technology by Prof. Earle Buckingham, it planned to introduce an additional factor *C* in its horsepower formula, which factor depends on the duration of tooth contact. It had been suggested to make *C* proportional to the  $3/2$ th power of the duration of contact, but the tests upon which the factor will be based will be completed the coming winter, and it has been decided to defer changes in the formula until then.

The committee had prepared a blueprint showing the variation of allowable working stress in forged steel,

A GENERAL report of the meeting of the American Gear Manufacturers Association, held at Buffalo, N. Y., Oct. 11-13, was published in last week's issue. Digests of the various papers and discussions were presented and reference made to other events of interest incident to the sessions.

The present article deals with the standardization side of the meeting. Reports were received from various sub-committees of the Technical Standards Committee, and while no new standards or recommended practices were accepted it will be seen that substantial progress has been made on some of the items under study.

Incidentally it was announced that the American Engineering Standards Committee will hereafter be known as the American Standards Association, its field of activities having become extended beyond purely engineering matters.

cast iron and phenolic materials gears, using for the curve for the latter the new formula for dynamic increment loads. The curves show that a phenolic materials gear is equal in strength to a cast-iron gear at a pitch line velocity of 1800 ft. p. m. and to a forged-steel gear at 4800 ft. p. m.

The Metallurgical Committee, C. B. Hamilton, Jr., chairman, had sent out a questionnaire regarding alloy steels for gears. All of the steels proposed by the committee received some support. Steel No. 2315 (S.A.E.) is in use by the largest number of gear makers, while Nos. 3115 and 3245 had about equal support. The list submitted included 16 other steels, but only three of these had

a considerable number of supporters. A case-hardening 5 per cent nickel steel, No. 2512, received favorable mention from several members, but the committee was in doubt whether these members used it for gears or for shafts. Several members urged the use of 3250 instead of 3245. Attention was called in this connection to the fact that the S.A.E. Handbook carries a note to the effect that steel No. 3245 was specified on request of the gear makers but that it is not recommended in the lower carbon ranges for use in gears.

The A.G.M.A. at present has a list of alloy steels for gears, of the steels in that list No. 2315, a  $3\frac{1}{2}$  per cent nickel case-hardening steel, and 2350, a  $3\frac{1}{2}$  per cent nickel oil-hardening steel, are retained, but No. 2345 is dropped, as it is the opinion that 2350 will meet all requirements if it is suitably drawn. No. 3115, a low chrome-nickel, case-hardening steel, is retained. There was considerable difference of opinion with respect to No. 3145, a low chrome-nickel oil-hardening steel. This steel is not an S.A.E. steel, 40 points of carbon being the maximum in the S.A.E. 3100 series of steels. Another thing against it is that No. 3240, which has about the same hardening properties as 3145, is definitely not recommended for gears. For these reasons it is in doubt whether No. 3145 will be included in the list that will be submitted to the membership later.



Other steels that will be retained include No. 3215, a medium chrome-nickel case-hardening steel; 3312, a high chrome-nickel case-hardening steel; 3340, a high chrome-nickel oil-hardening steel; 6120, a chrome-vanadium case-hardening steel and 6150, a chrome-vanadium oil-hardening steel. The list now includes a No. 3245, a medium chrome-nickel oil-hardening steel. This may be replaced by No. 3250, a steel with five points more carbon, as the latter has strong support, not only among A.G.M.A. members but also in the S.A.E. Iron and Steel Division. There will be added to the present list a No. 2512, a 5 per cent nickel case-hardening steel, which was favored by 98 per cent of those answering the questionnaire and which is said to be "easy to handle and most satisfactory where great strength is required."

#### New Steels Not Included

It has been decided not to include the new high-manganese case-hardening steels in the list, although several gear makers are using it successfully.

The Nomenclature Committee so far has adopted terms, abbreviations, definitions and formulae for spur gears and bevel gears, and other forms of gearing will be taken up in turn. It was decided to change the term cone distance (in bevel gearing) to cone length, mainly because the abbreviation C D is used in other forms of gearing for "center distance." The definition of backlash was changed to "the shortest distance between non-driving surfaces of adjacent teeth in mating gears." The "cone center" (in bevel gears) is hereafter to be known as the "cone apex."

The Keyway Committee, of which R. B. Zerfey is chairman, made a progress report. The committee had referred to it a program covering eight items. The first of these, standardization of keyway sizes, has been completed, a list of keyway sizes for a large range of shaft diameters having been adopted as Recommended Practice last spring. In connection with the second item, standardization of keystock sizes and materials, it is planned to recommend the use of low carbon keystock as now furnished by the steel industry. Mr. Zerfey thought that for special purposes where the low carbon steel had insufficient strength, a 40-50 point carbon steel might be recommended. The consensus of opinion, however, seemed to be that only one key material should be standardized and if anybody needed a special material he could select it himself.

Another item on the program relates to special keys, and Mr. Waterman suggested that it would be a good plan if the Library Committee would print tables of dimensions of such special keying systems as the Barth, Kennedy & Woodruff. In connection with splined shafts Mr. Zerfey suggested that the A.G.M.A. adopt the S.A.E. splined fittings. Mr. Waterman, in connection with the subject of inspection of keyways, referred to the method of diametral depth measurement. In measuring the depth of keyway in a shaft, this consists in advancing the cutter until it just touches the shaft and

then feeding it down, a distance equal to the depth of keyway desired. In the case of a gear the distance from the bottom of the keyway to the opposite side of the bore is measured.

The Spur Gear Committee had prepared a set of formulas and tables for use in determining the necessary dimensions of spur pinions which are to transmit certain horsepower at certain speeds, and offered these for discussion and criticism. In order to place some limit on the work of tabulation, the maximum tooth stress was set at 20,000 lb. p. sq. in. and the maximum pitch line velocity at 2000 ft. p. m. First the necessary shaft diameter (bore of pinion) is determined by the well-known formula, and a table is included which gives the necessary diameters for shaft stresses of 4000, 6000 and 8000 lb. p. sq. in.

After the shaft diameter has been found the minimum permissible pitch diameter is determined by means of the equation

$$pd_m = d + 2 (\text{depth of keyway} + \text{dedendum} + N/5 \div \text{diametral pitch}),$$

this being based on the consideration that there must be a certain minimum depth of metal between the bottom of the teeth and the keyway. Next the pitchline velocity for this pitch diameter and the given speed of revolution is calculated, and then the permissible tooth stress at this velocity, and the tooth load. Finally the actual tooth stress is calculated by the Lewis formula, modified to take account of the dynamic increment load. This tooth stress is to be limited to 20,000 lb. p. sq. in. with forged steel, 15,000 with cast steel, 10,000 with bronze, 8000 with cast iron and 6000 with non-metallic materials.

#### Pinions With 15 to 30 Teeth

The tables cover pinions with from 15 to 30 teeth. For each tooth number, four or five diametral pitches are selected, the largest being such that for a speed of 2000 r.p.m. the pitchline velocity does not exceed 2000 ft. p. m. The face is taken equal to 10 divided by the diametral pitch and rounded out to the next highest full quarter inch.

In the tables, data on pinions are given under the following headings: Number of teeth, diametral pitch, pitch diameter, face width, r.p.m., hp., pitchline velocity, tooth stress and material.

There was some objection to the way in which non-metallic materials were mentioned in the tables, and it was also pointed out that in calculating the stress in the pinions for which such materials were recommended, the velocity increment factor for metal gears was used, instead of that for non-metallic materials. It was decided to take care of the materials in special tables.

G. M. Bartlett, chairman of the Sprocket Committee, said that although the committee had not made any definite proposals for standardization for some years, it had a good many projects

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**A** COMPLETE overhaul of block and roller chain standards is contemplated by the Chain and Sprocket Division of the A. G. M. A. Standards Committee.

There seems to be a general trend toward the use of heavier chains. The present light and medium series of chains are to be cancelled, the heavy series is to be known as the standard series, and a new heavier series, to be known as the heavy series, is to be added.

Tolerances are to be laid down for all parts of roller chains, with a view to making parts of different manufacture interchangeable. For light industrial work a block chain series, similar to bicycle chains, is to be standardized.

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under consideration. First of all it planned to cancel a number of standards adopted seven or eight years ago that were no longer needed because of changes in practice. These included the narrow, medium-weight and light-weight series of roller chains. The present heavy series is to be retained and to be known as the standard series. There will be added a new extra-heavy series, which will differ from the new standard series in having side plates  $1/32$  in. thicker for pitches up to 2 in. and  $1/16$  in. for larger pitches. A standard light-weight series is also to be added, of  $1/2$ -in. pitch and  $1/4$ -in. width. This chain, which is a development of the bicycle chain, has no roller. It is at present widely used in light machinery drives. The  $3/8$ -in. pitch standardized roller chain was never made, and this standard also is to be canceled, and another rollerless chain substituted for it.

### Interchangeable Chain Parts

Clearances and tolerances are to be established for side plates, pins and bushings, and this is thought to be a real step in advance, as it will make chain parts of different manufacture interchangeable. The rounding curve at the end of sprocket teeth is to be changed so as to reduce the likelihood of interference when the sprockets are not quite in line. Instructions will be issued to pattern makers for making patterns for cast sprockets that are not to be cut.

Another item upon which the committee is working is standard spacing for multiple chains. For a long time the committee has been planning to work and formulae for the permissible working loads and horsepower of rollers chains at different speeds, and also for the maximum permissible speeds, and it has now arrived at such formulae. The breaking strength formula will be canceled, because its significance was often misunderstood.

There will be some slight modifications in widths and roller diameters of the standard series that are continued, these being instances where American practice has not followed the standard. Tolerances for sprocket thickness have been increased, for greater ease in manufacture. Symbols have been adopted for double, triple and quadruple chains.

The Tooth Form Committee, H. J. Eberhardt, chairman, had revised the  $14\frac{1}{2}$  deg. and 20 deg. full depth tooth form systems. It expects in the near future to prepare tables of chordal dimensions for all tooth form systems so far adopted. No agreement has yet been reached regarding the amount of hole modification to ensure tip relief, but practice is now evolving in the direction of reduced relief. One thing that makes this possible is that gears are now more rigidly mounted.

## Rubber Bushings Introduced

**R**UBBER bushings with the rubber "bonded" or vulcanized to metal inner and outer bushings have been developed by the Lord Manufacturing Co. of Erie, Pa., and are being offered to automobile and aircraft manufacturers for such parts as engine suspensions, spring shackles, gear shift lever mounts, body mountings, etc.

The joints and mountings manufactured by this company are constructed as insertable units. As used for engine mountings, the bushing units are inserted with a press fit into a plate bolted to a frame channel or a cross-member, with the engine bolts passing through the inner metal shell. As shown in Fig. 1, the rubber in the bushing is beveled at both ends so as to put the rubber under initial tension when in place. This is demonstrated in Fig. 2 which shows the inverted mounting used in the A.C.F. Metropolitan Coach in which the engine is hung below the frame.

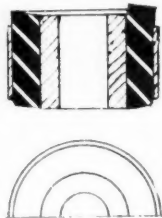


Fig. 1—  
Bonded rubber engine mount bushing, in section

The rubber projecting above the outer bushing in Fig. 2 is under compression and provides a snubbing action for severe shocks to the frame or engine. Since for all except these unusual conditions the rubber is under tension and since there is no metal-to-metal contact, this type of rubber mounting should prove particularly effective in reducing the transmission of engine vibration and noise to the frame.

Bonded rubber bushings are also being offered as original equipment for spring mountings. In these half of the rubber will be under compression and half under tension. The bushings can be inserted in place of the usual bronze bushing and shackle pin. With no metal-to-metal contact, metallic rumble and such noises as rear axle hum should be considerably isolated. Of course their use here also eliminates the necessity of shackle lubrication.

**T**HE Model DB7 has been added to the line of the Sterling Motor Truck Co. of Milwaukee. This is a six-cylinder unit of  $1\frac{1}{4}$ -ton capacity. It is powered with a 54-hp., seven-bearing crankshaft engine of  $3\frac{3}{8}$  in. bore and 4 in. stroke, with removable head and full pressure lubrication which reaches all bearings. It is equipped with a sliding gear, four-speed transmission, four-wheel hydraulic service brakes and transmission emergency brake. Other features are cam and lever steering gear, chrome-vanadium springs and multiple disk clutch.

Standard equipment includes electric starter, electric lighting equipment, 32 by 6 pneumatic tires, speedometer, generator, gascolator, air cleaner, oil filter, tire carrier and spare rim.

**A** SEVENTH international aircraft exhibition will be held at Olympia, London, July 16-27, 1929, according to an announcement of the Society of British Aircraft Constructors, which will organize the show jointly with the Society of Motor Car Manufacturers and Traders. The last previous aircraft exhibition in London was held in Olympia in July, 1920, and the last one before that in February, 1913.

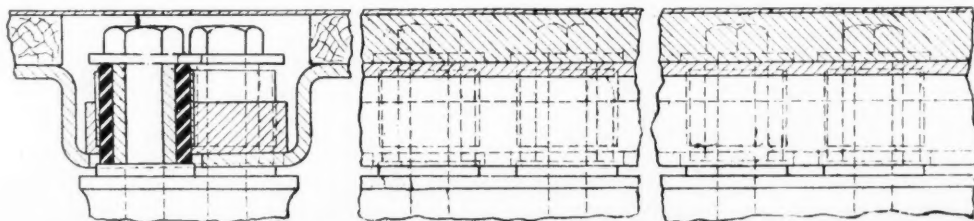


Fig. 2—Installation of Lord engine mount on A.C.F. Metropolitan coach. The mountings are in the inverted position, the engine being hung below the frame



# Just Among Ourselves

## An Endurance Story in Statistics

ANOTHER addition to our file of useless but interesting information has arrived in the form of some statistics about the recent Studebaker 30,000-mile run to Amatol. Particularly interesting was the fact that each piston in each of the cars traveled nearly 93 miles during the run; each valve opened 33,660,000 times—often, we estimate, even than a moron's mouth during the course of a seven-reel motion picture. Total revolutions of each engine were 67,320,000, while the total explosions of each motor were 269,280,000. Seriously, however, broken down in this way the figures do visualize and emphasize the performance through which a modern automobile is called upon to go to prove to a modern public its stamina and durability.

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## Carrying Their Eggs in Two Baskets

DESPITE the new competition of industry with industry there is, every year, a closer interlocking and a closer interdependency between industries. Take the much-talked-of competition between automobiles and the railroad; many of the leading executives of the automotive business today are members of the board of directors of one or more railroads. Walter Chrysler is on the board of the Erie, and the Ann Arbor; A. P. Sloan, Jr., is on the Nickel Plate board; J. D. Mooney, the Rock Island; Fred J. Fisher, the Big Four and the Michigan Central; John N. Willys, the Ann Arbor and the Wabash; Chas. W. Nash of the Chicago & Northwestern; Henry and Edsel Ford of the

Toledo & Ironton. Maybe there are some more; these are just a few we have heard or read about recently. This type of interlocking interest should help materially the work of properly coordinating the work of all the various types of transportation which has been going on actively for some five or 10 years now.

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## Future of London Show in Doubt

ENGLAND seems to be going through the same sort of difficulties as regards new model announcements which have faced the United States for a good many years. A proposal to discontinue or to hold only every other year the London Show is getting serious consideration because some people believe that the big exhibition causes buying hesitation during the weeks preceding it. *The Autocar* claims that it is not the show which is responsible for this hesitation, pointing out that the 14 weeks of slow buying usually experienced is terminated by the show; the hesitation comes, *The Autocar* believes, as we interpret its editorial comment, from the fact that announcements are likely to be made at almost any time during the period and advocates as a remedy agreement to make simultaneous announcements of new models every year, preferably on the first of August.

\* \* \*

## Opposite System Followed Here

FROM this distance and based on American experience, we would agree heartily with the value of a yearly show as a means of keeping the public interested in the automobile. Over on this side we have felt for a

long while the remarkable value which our manufacturers get as compared with makers of any other line of products; a merchandising spectacle to which people rush to pay to see certainly is not a thing to be discontinued lightly. American experience would indicate, however, that the best way to avoid regular buying slumps at given periods each year is to do just the opposite of what our contemporary suggests. If a majority of announcements are regularly made at a given date—show or no show—a buying hesitancy preceding that date seems almost inevitable. It will be interesting to see how our British cousins work the matter out, however, as we may in the long run have a chance to learn something from their experiences along this line.

\* \* \*

## European Car Prices Dropping

GRADUALLY European car makers are getting their manufacturing on a more efficient basis and gradually their prices are falling. The London show saw a general, although small, reduction in British prices and rumor says that German lists will go down about the time of the Berlin show in November. Our own domestic price trend, of course, has been downward for some time, which means probably that we still are as far ahead in providing efficient, low cost transportation as we ever were. The general lowering of the car price structure throughout the world in recent years, however, should mean the piercing of new sales frontiers by the motor car every year. And that is just what has been and is happening.—N.G.S.

# Marmon Adopts "High-Frequency Oscillating Modulator"

Device is designed to damp torsional vibration and consists of relatively light metal disk, accurately balanced and mounted on rubber base on crankshaft

By M. Warren Baker

A NEW "high-frequency oscillating modulator," invented by Thomas J. Litle, Jr., chief engineer, is now being fitted to both series of Marmon eights. The device described by the above term is a new form of torsional vibration damper, and consists of a relatively light metal disk, accurately balanced and mounted on a specially prepared rubber base on the crankshaft. Figs. 1A and 1B give an idea of the construction and mounting of the device.

Mr. Litle has made a study of vibration-damping in modern high-compression, high-speed engines for several years. He believes torsional vibration to be one of the most important factors mitigating against smoothness of operation of cars. "These vibrations have been very carefully recorded," he said in explaining the operation of the new modulator, as regards both periodicity and amplitude, and it remained for the inventor-engineer to devise some means of counteracting the effect of shaft twisting under load.

By the employment of a relatively light disk, balanced and mounted on rubber, rather unusual results were obtained, Mr. Litle said, and these results were so satisfactory that the development work was concluded and the device then adopted for regular production by Marmon.

In operation, at the first indication of vibration through the shaft, the modulator begins to oscillate at high frequency, building up slight tremors and counteracting crankshaft vibration in the early stage. Not only does it build up the modulations in the early stage, but it counteracts shaft vibrations at regular periods throughout the speed range.

"Angular vibration of a shaft depends upon the speed of rota-

tion and the number of impulses per revolution," Mr. Litle said in regard to this feature of the modulator. "The period of vibration of the shaft, however, is comparatively low, because of its great mass. The period of vibration of the damper is so high that there will be a great number of oscillations of the disk to one of the shaft. The great restoring force of the rubber will dominate over the inertia of the disk, which latter is of small mass.

"Now, for a given number of vibrations of the mass of the shaft there will be an endless number of possible harmonics, both lower and higher than the fundamental, but as we proceed up the scale of these harmonics, their effect upon the fundamental decreases.

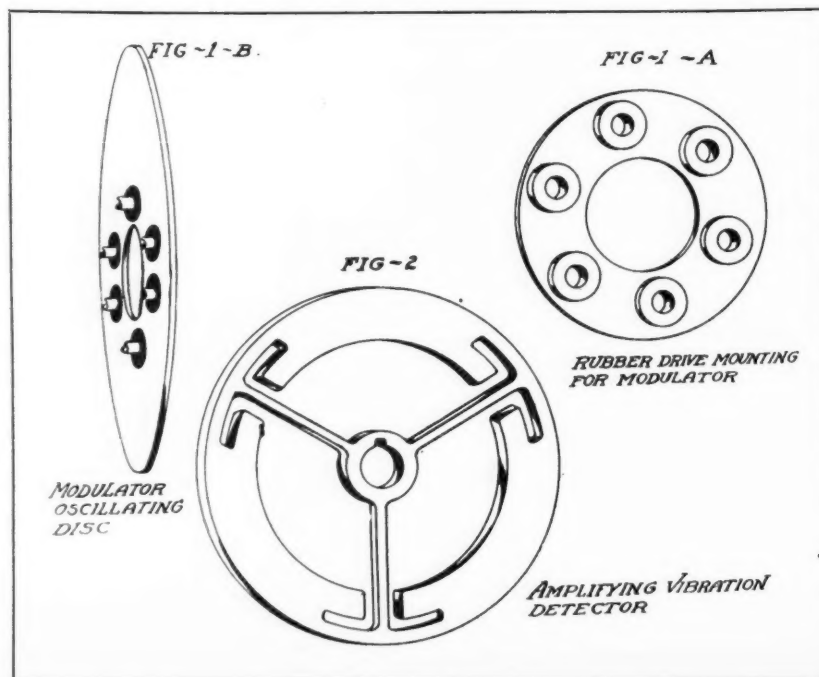
## Harmonic Effect Unnoticeable

"Therefore, through the normal range of shaft speed, the possible periods of angular vibration of the shaft are slow relative to the period of vibration of the damper, and the harmonic effect of the damper upon the shaft is unnoticeable.

The damping effect probably is due to the fact that the rapid period of vibration of the damper plate ex-

ists rather independently of the speed of the shaft, and consequently catches and dampens the possible vibrations of the shaft at the very moment of their inception, so that they do not reach any substantial amplitude.

"If two elements simultaneously vibrate at different periods, yet have periods fairly close together, they will be in apparent tune or harmony through a wider range of vibration than would be the case if the difference were great.





"If an engine shaft were run up very considerably above commercial speeds, thus making possible a period of vibration much closer to the period of vibration of the damper plate that are obtained at commercial speeds, the harmonics of the shaft and damper would be found to be closer together and would



Diagram of action of Marmon oscillating modulator. Line Y represents crankshaft torsional vibration. Line X represents the counteracting effect of the oscillating modulator, and line Z represents the resultant curve after modulation

have a wider range through which they would have harmonic effect than that existing in the commercial or normal structure."

An interesting device to prove the existence of numerous periods was used in the experimental work at the Marmon factory. It is known as a vibration exploring mechanism, and is essentially a triple tuning fork. It was made up in circular form (Fig. 2) and keyed to the crankshaft. When the car was started away in second gear, for instance, three recurring notes were sounded. When driving in high gear at varying speeds, five distinct tones were audible, some of them representing periods that were not known to exist previously. All of these vibrations are said to be effectively stamped out by the new device.

## Annual Highway Bill Placed at \$2,000,000,000

**T**OTAL highway expenditures in the United States at the present time are placed at about \$2,000,000,000 a year in a report made by an engineering commission appointed by the National Paving Brick Manufacturers Association to conduct an investigation of paving and general highway conditions.

The waste due to incompetent supervision is estimated to be about \$400,000,000 a year. Considerable stress is placed upon the necessity of employing only trained highway engineers to supervise all highway work so that this waste can be eliminated.

The statement is made that the paving programs, including new construction and reconstruction, will grow larger each year in both the centers of population and on rural highways, and due to the constantly increasing traffic there will be a considerable increase in the higher type construction, particularly on rural highways.

In discussing maintenance, the report says:

"Generally speaking, the maintenance on the state highway systems is of a high standard and the pavements are kept in good condition.

"The average maintenance of the country roads is only fair and in the boroughs and townships it is generally poor.

"Lack of adequate maintenance not only to provide smooth riding pavements, but to conserve the investment in pavements, results in an enormous waste of public funds.

"Three outstanding causes of poor pavements are: Lack of control over construction; inadequate founda-

tion; lack of proper provision to remedy poor sub-soil conditions.

"Lack of control over construction is the outstanding cause of poor pavements and one that will never be corrected until highway work is divorced from politics. This is a problem for the highway users to solve. The other two are up to the engineers."

The commission making the report is composed of the following: William H. Connell, consulting engineer, chairman, until recently chief executive of the Pennsylvania State Highway Department; Warren R. Neel, chief state highway engineer of Georgia; Perry J. Freeman, chief engineer of the bureau of specifications and tests, Allegheny County, Pittsburgh, Pa.; Frederick J. Cellarius, consulting engineer, formerly city engineer of Dayton, Ohio.



## Books for the Business Bookshelf

### Garage Management and Control

By Joseph E. Mills; A. W. Shaw Co., Chicago., 300 pp. Illus. \$3.

**T**HIS volume presents a rather comprehensive review of all the steps necessary in organizing a garage and operating it successfully. To aid in the organization of a garage business the author presents information concerning the tools and equipment needed, type and size of building required, how to determine the potential field for service, the financial details of organization and selection of shop personnel. With the garage established, further help is offered by chapters on wage payment, flat rates, order routines, time keeping, parts purchasing and storing and all the other items which are influential in determining garage management problems.

### Electric Heating

By Edgar A. Wilcox. McGraw-Hill Book Co., New York. 469 pp. Illus. \$5.

**T**HIS volume on electric heating has been written primarily for the use of central station men and others interested in the production and sale of current. Nevertheless it appears to have a considerable field of interest to users of electric heating equipment, which nearly all automotive plants are to some extent at least. The chapters on subjects such as resistor elements and heating units, oven heating, heating furnaces, are welding, and others of like nature, contain information of considerable value to those who make use of such electric equipment.

**V. J. MATRANGA** of Elizabeth, N. J., has been granted a patent on a weather-proof hinge which is intended particularly for automobile hoods. It comprises a pair of cooperating members forming a pintle roll, and a weather-strip on one member which engages with the other member so as to provide a tight joint between the members at the outside line of separation.

**T**HE Royal Automobile Club of Great Britain plans to organize for next spring a trial for vehicles operating on fuels other than gasoline and benzol. If there is enough support a class for vehicles using solid fuels such as coal dust will be provided for.

# NEW DEVELOPMENTS—Automotive

## Fraser Electric Control

THE Fraser Electric Control unit for gas-electric buses has been developed to commercial status by the Fraser Electric Transmission Corp., Cleveland, and is being marketed through the National Railway Appliance Co., 420 Lexington Ave., New York.

This unit, which was described briefly in its early stage of development in *Automotive Industries* (Dec. 24, 1925), is an electrical machine which transmits and

controls the power from an engine to the rear axle of a gas-electric bus.

While it operates, in general, similarly to the usual motor and generator units in gas-electric drives, the Fraser unit has certain desirable features not found in other types. Principal among these are the savings in weight. Use of the Fraser unit eliminates from the

mechanical-driven bus the starter, flywheel, clutch, transmission and lighting generator, or a total of about 600 lb. The Fraser unit of 100 hp. capacity weighs about 1400 lb., so that the net increase in weight over the mechanical drive is about 800 lb., considerably less than is possible with conventional gas-electric drives.

The design feature of the unit is the use of a single field and housing for both the generator and the motor armatures. This design saves space and weight and is said also to provide operating advantages of importance. The field coils and poles are mounted inside the rotating members, and since both the generator and motor inductors rotate in a single magnetic field, armature reaction is said to be eliminated.

This construction permits the use of large diameter inductors having high conductor speeds with low rota-

tive speeds and long torque radius without increasing their weight. Generator and motor function as independently of each other as they would were they widely separated. Variations of motor speed and torque are produced both by engine throttle changes and electric controller manipulation. Through the latter a 100 per cent over-drive is provided by means of which it is possible to drive a loaded bus on level roads at a speed of 60 m.p.h. with the engine turning over only 1800 r.p.m.

## Timken Brakes Converted

TIMKEN Duplex brakes, which have been used with mechanical hook-up on Timken axles for some years, are now being offered with hydraulic operating gear. The new system comprises operating cylinders mounted at the ends of the brake levers—rather than in the brake drums—a worm-type of slack adjuster to permit of compensating for wear of the lining, a master cylinder and piping. The system is applicable to front as well as rear brakes and it is used as a four-wheel brake system on the new Type-W Yellow bus with Cadillac engine, which was introduced recently.

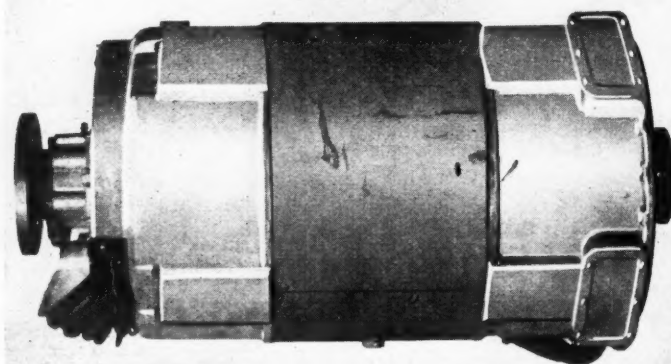
There are two pairs of shoes expanding against a single drum, each pair being actuated by a separate cam, camshaft and lever. One of the levers is located in front of the axle and the other to the rear thereof. One pair of shoes in each drum may be used for service braking and the other as an emergency brake, but when the system is hydraulically operated both pairs are applied simultaneously for service braking.

The brake operating cylinder is mounted between the eyes of the two brake levers, and it may be removed by taking out two clevis pins and disconnecting the hose. The cylinder has a rubber piston cup and a long tubular piston. The clevis which attaches to the lever opposite the head of the piston has a long stem which slides in the piston and has a shoulder against which the piston acts. This construction permits the clevis to slide outward without affecting the hydraulic system, the latter action taking place when the brake is applied mechanically, for parking.

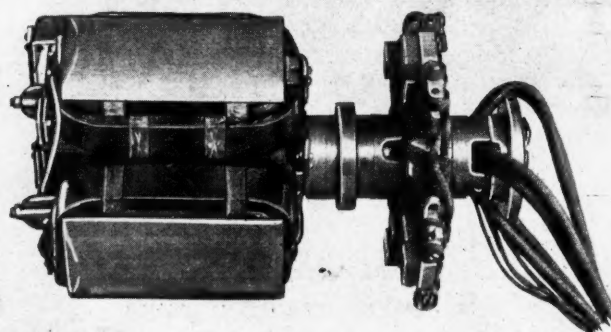
The slack-adjuster assembly is placed at the end of the brake lever at the point of attachment to the brake



Multi-cylinder generator commutators



Fraser bus unit complete



Assembled field element



# Parts, Accessories and Production Tools

camshaft. An integral worm wheel is machined in the end of the brake camshaft and a worm is mounted in the end of the lever.

The Timken-Detroit Axle Co., manufactures the entire brake mechanism together with the brake operating cylinder. The balance of the system, including the master cylinder and piping, is obtained from the Hydraulic Brake Co., Detroit, Mich.

The front brake mechanism is practically identical with that here described, except that the camshafts are somewhat shorter, in order that the brake levers may be close to the wheel and permit the brake operating cylinder to pass over the front axle steering knuckle.

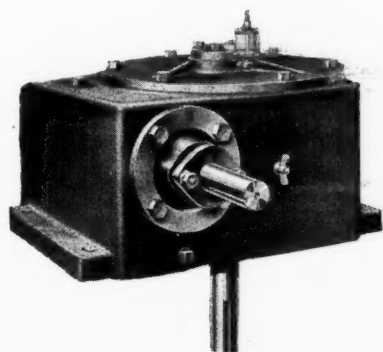
## Electric Car Spotter

A NEW type electric motor-driven car pulley and spotter has been developed by Foote Bros. Gear & Machine Co., 215 N. Curtis St., Chicago. The reduction unit used is the same as that used in the Foote Bros. vertical worm gear speed reducer. The motor is connected to the worm shaft of the spotter through an inclosed spur-gear drive which provides part of the reduction. The capstan is made of cast iron and is keyed to the upright vertical shaft of the reduction unit.

This unit is furnished in two sizes—one having a rope pull of 3000 lb. and requiring a 5 hp. motor; the other having a rope pull of 6000 lb. and requiring a 10 hp. motor.

## Vertical Speed Reducer

A VERTICAL type, heavy-duty, worm gear speed reducer arranged for vertical driving with the driveshaft projecting either from the top or bottom



*James vertical  
shaft speed re-  
ducing unit*

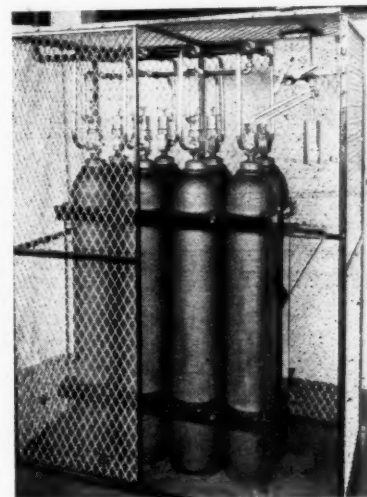
has been developed by the D. O. James Mfg. Co., 1120 West Monroe St., Chicago. Timken bearings support both sides of the gear shaft and the worm shaft is mounted on double Timken bearings on one side and on Norma-Hoffman roller bearings on the other.

Gear shafts are 0.40 carbon steel, ground to size. Worms and shafts are integral and made of S.A.E. 3140 chrome-nickel steel, generated, heat-treated, ground and relieved. Gears are made of phosphor bronze.

## Alfite Fire Extinguisher

THE Alfite system of fire protection has been developed by American-LaFrance and Foamite Corp., 250 West 57th St., New York. An inert gas, known as Alfite gas, is confined in a liquid state in

*The Alfite fire fighting system consists of dry carbon dioxide gas stored under pressure in steel cylinders arranged for simultaneous discharge into piping leading to protected spaces*



metal cylinders. When the system is placed in operation the gas is permitted to escape through nozzles located at the fire where it expands and dilutes the air to smother the flame.

Operation may be manual, semi-automatic or automatic and a variety of operating devices are available. The gas used is not toxic, does not damage machinery, does not freeze or deteriorate and is inexpensive. Air diluted with 17 per cent of the gas will not support combustion but installations are designed to supply 35 per cent dilution. This dilution can be obtained in one minute and a fire is under control in 30 sec.

## French Using Nitrided Parts

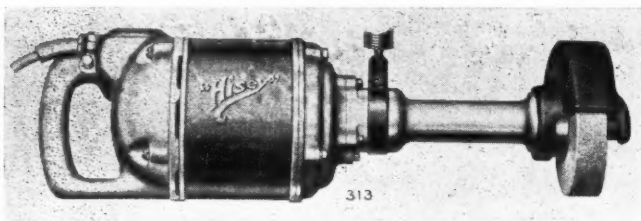
THE nitriding process, introduced in France nearly three years ago by the steel firm of Aubert & Duval Freres, has now stepped from the experimental to the production stage. So far as can be ascertained, nine firms are making use of this process on various parts of their cars. The new model straight-eight Amilcar, just put on the market, has a five-bearing nitrided crankshaft. The same firm produces sports type car with a 67 cu. in. supercharged engine, which is practically a duplicate of the racing model and has a roller bearing crankshaft. This roller bearing crankshaft has now been replaced by a plain bearing nitrided crankshaft, the bearings merely being lengthened 2 mm. Chenard Walcker is making use of a nitrided crankshaft for a six-cylinder engine, and is also treating the helical timing gears in the same way.

Salmson has adopted the process for the crankshafts of its 67 cu. in. sports type engines. Hispano-Suiza is nitriding the steel sleeves of both aviation and automobile engines.

On the two new Citroen models the water pump shafts and the worm and sector of the steering gear are nitrided. Ballot is employing the process for all the timing gears on his engines. Delage, Delaunay, Belleville and Donnet have nitrided pushrods, rockers and camshafts. Other firms are experimenting with this process and are expected to adopt it commercially at an early date. The most interesting feature of this development appears to be the use duralumin connecting rods direct on the nitrided shaft, without the use of any anti-friction material. Among those having experimental engines running with this type of rod and shaft is Citroen, who is carrying out tests on both the bench and on Montlhery track. The advantages recorded so far are cheapness, reduced weight and increased power. It is claimed that no disadvantages have yet developed.

## Portable Grinder and Buffer

THE Hisey-Wolf Machine Co., Cincinnati, has brought out a new  $\frac{1}{2}$  hp. portable grinder and buffer equipped with ball bearing motor and Timken roller bearing grinding spindle. A commutating type repulsion-induction motor is provided for a single-phase



*Hisey-Wolf portable grinder and buffer*

service and a squirrel cage motor for two and three-phase service. A compound wound motor is offered for direct current.

A cast-steel wheel guard is adjustable to any angle to suit the convenience of the operator and a two-pole switch is controlled at the grip handle. The new tool is made in 1, 2 and 3 hp. sizes for a-c. use and in 1 and 3 hp. for d-c.

## U. S. Portable Drills

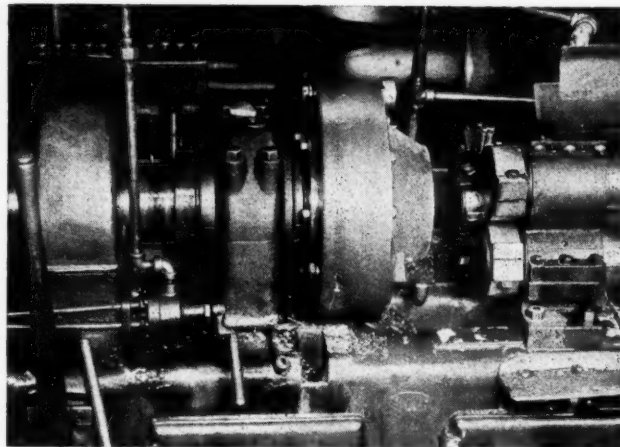
THE United States Electrical Tool Co., Cincinnati, Ohio, has recently brought out two  $\frac{1}{4}$  hp. portable electrical drills, one equipped with direct drive for a shaft speed of 10,000 r.p.m. and the other with a gear reduction drive to give a shaft speed of 2000 r.p.m. Both tools weigh about 4 lb. Keyless chucks are used in both tools and both have universal motors, SKF ball bearings throughout, double silk insulated enameled armature wire, chrome nickel steel gears, one-piece frame and commutator head and trigger switch.

## Reo Differential Supports

IN machining differential supports great care must be exercised to insure absolute parallelism between the front or pinion carrier face and the centerline of the axle bearings. In present machining practice of the Reo Motor Car Co. special machines and fixtures have been developed whereby this is obtained with a minimum of deformation caused by machining strains.

After the casting comes from the foundry and is

rattled, snagged and chipped, it is straightened in a Watson-Stillman press. A special automatic lathe is then employed to rough and finish the pinion carrier surface and to rough and finish ream the hole in this surface. The diameter of the hole is held to plus 0.001, minus 0.000 in. tolerance. The horizontal centerline



*A special automatic lathe is employed to rough and finish the pinion carrier surface and to rough and finish ream the hole in this surface*

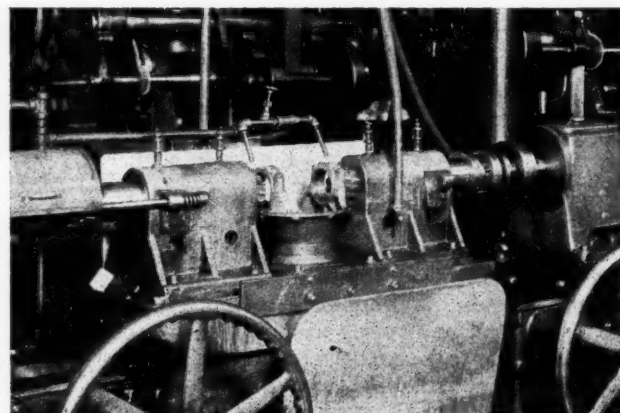
through this hole must not be above nor more than 0.002 in. below the horizontal centerline through the bearing bosses at the pinion carrier face.

A Fox multiple-spindle drill press is next employed to drill ten  $\frac{29}{64}$  in. holes in the flange at the rear face, eight  $\frac{23}{64}$  in. holes in the pinion carrier face and four  $\frac{13}{32}$  in. holes in the bosses.

The first two sets of holes are countersunk in a Rockford drill and the casting goes to a special two-way boring machine where the bearing holes are rough bored. The pinion carrier face and the finished bosses are employed for locating in this operation and the use of two spindles operating simultaneously from either side has been found to cause a minimum of deformation in the piece so that accurate parallelism between the holes and the pinion carrier surface is obtained.

The pinion carrier face is next ground in a rotary surface grinder and the bearing holes are line reamed and tapped in a Barnes special two-way boring machine.

The eight holes in the pinion carrier face are tapped in a Barnes tapper and the holes in the axle housing flange are spotfaced in a Rockford drill which completes the machine operations on the piece.



*A special Barnes two-way boring machine is used to line ream and tap the bearing holes*



# Pedestrian Problem Seen *Uppermost* *in* Accident Situation

Increasing population is congesting streets with result that more than two-thirds of traffic victims are pedestrians.  
Adoption of uniform motor vehicle laws is urged.

**I**N an analysis of highway accidents and a discussion of their causes and methods of prevention, Charles M. Upham, secretary-director, American Road Builders' Association, finds that—

The human factor is responsible for 95 per cent of all highway accidents and that the mechanical and engineering factors are responsible for the remaining negligible portion.

The human factor which causes highway accidents is in a large degree caused by certain definable physical conditions such as conflicting traffic laws, traffic congestion, discourtesy, carelessness, physical incompetency and lack of confidence in the mechanical stability of a motor vehicle.

The pedestrian problem is increasing while the motoring hazards in themselves are only slightly decreasing.

The alarming number of children killed in highway accidents makes necessary some drastic action in their behalf.

No enforceable legislation will strike at the root of highway accidents.

The daily cost of highway accidents in this country, according to the figures assembled by Mr. Upham, is 2261 persons killed or injured, and an economic loss of nearly \$2,000,000. During the year 1927, highway accidents exacted a total of 26,618 lives, 798,700 persons seriously injured, an economic loss of over \$800,000,000, and property damage to some 8,000,000 automobiles.

## Accidents and Registration

Since the year 1922, the number of persons killed annually in highway accidents has been steadily increasing. In the former year, 19,203 persons were killed, as compared with 26,618 in 1927. Fatalities increased 38 per cent during this period while automotive registrations increased 90 per cent. This would seem to indicate that highway accident fatalities are decreasing in proportion to the number of vehicles in use. For practical purposes this is true. It is a fact, however, that the increase in highway accidents continues to climb steadily, while the annual increase in automobile registrations has failed to maintain its steady upward trend.

This is caused by two things—the increase in population and the wider use of registered automobiles. The National Safety Council has made a careful study of the population factor in highway accidents. The Council believes population to be the most important factor in the annual increase of these accidents. The American Road Builders' Association points out that increased population not only causes more pedestrians to be upon the streets, but it increases the congestion of pedestrian traffic and the resultant confusion in a

far greater proportion. This reasoning can only lead to the conclusion that the pedestrian problem in highway accidents is becoming of increasing importance each year. An examination of highway accident statistics will prove this conclusion to be true. Today more than two-thirds of all fatalities are pedestrians. Last year pedestrians were the major factor in causing 11,367 out of 26,618 fatalities, as compared with 11,765 caused principally by motorists.

## Increase Would Continue

With these truths in mind, it must be concluded that even though the registration of automobiles should not increase at all, the number of highway accidents occurring each year would continue to climb at an alarming rate as a result of the constantly increasing population and wider use of motor vehicles.

The National Safety Council has estimated that unless highway accidents are checked, 40,000 persons will have lost their lives as a result of them in 1935. The first six months of 1928 indicated another increase in the highway accident toll for the present year. When the final figures become available it is believed that the death total will have reached nearly 28,000 for the year 1928.

The American Road Builders' Association recommends the immediate adoption, so far as practicable, of the uniform state and municipal vehicle laws prepared by the National Conference on Street and Highway Safety. The organization further believes that the examination and licensing of all drivers is essential for the progress toward highway safety.

Any additional move to reduce the highway accident toll must deal directly with the individual. Systems of pedestrian control have not as yet been developed to the point where they might be incorporated into a uniform national vehicle code, and until an adequate and successful system is developed, the various cities of the United States must continue to study their own particular pedestrian problems.

**T**HE Standard Motor Truck Co., Detroit, recently built a special wrecker for the Detroit Fire Department to meet emergency service demands of fire-fighting equipment. Its primary work is to be able at a moment's notice to go anywhere to assist in towing or repairing disabled fire apparatus. It is powered with a Continental 15-H six-cylinder, 4½ by 5¾ in. engine. Dual ignition is provided, battery and magneto, with two spark plugs to each cylinder. A nine-speed Brown-Lipe transmission is employed, permitting a road speed of 45 to 50 m.p.h. in high gear. Final drive is through a Timken worm drive rear axle and braking is provided by four-wheel Bendix equipment. Budd steel disk wheels are standard.

First with  
the News

Reliable and  
Accurate

# News of the Industry

PAGE 602

VOLUME 59

Philadelphia, Saturday, October 27, 1928

NUMBER 17

## Factory Operation High, Market Show Recession

PHILADELPHIA, Oct. 27—Seasonal influences, with the close approach of national elections, have brought about a reduced volume of retail automobile and truck sales, a condition, however, which as yet has had only slight effect on factory operations.

Factory operations in the first three weeks of the month indicate a production approximating and possibly exceeding the 400,000 mark. This will be well in advance of the 349,000 total set up in October, 1926, the industry's record year, and will bring the 1928 total above the 1926 total for the first 10 months. With the likelihood that a certain amount of deferred business will be released after election, indications are that a high rate of operations will continue through the late months and will insure a new year's total.

A definite sign of the high rate of retail business is found in the absence of any special sales drives by factories at this season. Dealer stocks generally are low and sales are continuing in such volume that there is only minor accumulation. An actual shortage of cars in several lines is continuing. Used car demand has slowed down perceptibly in several sections.

## Packard Year's Net Rises to \$21,885,416

DETROIT, Oct. 25—Packard Motor Car Co. reports earnings in the fiscal year ended Aug. 31 of \$21,885,416, equivalent to \$7.28 a share on its 3,044,264 shares of stock. This compares with \$11,743,498, equal to \$3.91 a share in the preceding fiscal year. Sales increased to \$94,677,390 from \$71,659,188. Total assets on Aug. 31 were \$75,177,324 compared with \$61,044,632 a year earlier. An extra cash dividend of \$1 payable Nov. 30 has been declared, bringing cash dividends this year to \$5.

### Graham-Paige Motors

Graham-Paige Motor Corp. earnings in the quarter ended Sept. 30 were \$922,769 and for the nine months' period, \$2,493,478 equivalent to \$1.58 a share on common stock. The predecessor company in the same period last year had net loss of \$1,796,104.

## September Output Placed at 434,915

WASHINGTON, Oct. 22—Production of cars and trucks in the United States and Canada in September totaled 434,915 as against 492,601 in August and against 271,649 in September last year. Production for the first nine months of 1928 totaled 3,671,727 as against 3,068,255 in the same period last year and against 3,680,241 in the first nine months of 1926.

Revisions of the August total bringing the production to 492,601 is an increase of about 3000 over the first report.

Passenger car production in the United States in the first nine months totals 3,064,237 as against 2,540,312 last year. Truck production for the same period in the United States was 404,838 against 366,360. Canadian passenger car production in the first nine months was 168,833 against 133,184 last year, and truck production was 33,819 against 28,399.

September passenger car production in the United States was 358,872 against 400,593 in August and against 226,443 in September last year. Truck production for the month was 54,850 against 60,763 in August and 33,944 in September last year. September passenger car production in Canada was 16,572 against 24,274 in August and 8681 in September last year. Truck production was 4621 against 6971 in August and 2581 in September last year.

## Federal Screw Buys Chelsea

DETROIT, Oct., Oct. 25—Federal Screw Works, this city, will take over the Chelsea Screw Co., Chelsea, Mich., increasing its productive capacity 50 per cent. M. J. Dunkel, president of the Chelsea company, will become a vice-president and director of Federal.

## First Nine Months Exceed All of 1927

1928			
	Cars	Trucks	Total
Jan. ...	212,351	27,875	240,226
Feb. ...	301,466	34,847	336,313
Mar. ...	387,044	43,811	430,855
Apr. ...	385,394	49,008	434,402
May ...	405,627	54,178	459,805
June ...	381,963	43,300	425,263
July ...	358,914	58,433	417,347
Aug. ...	424,867	67,734	492,601
Sept. ...	375,444	59,471	434,915
Total 3,233,070	438,657	3,671,727	
1927			
Jan. ...	211,395	42,908	254,303
Feb. ...	278,997	44,421	323,418
Mar. ...	365,634	52,059	417,693
Apr. ...	377,899	51,471	429,370
May ...	379,141	50,682	429,823
June ...	295,199	45,976	341,175
July ...	245,587	33,885	279,472
Aug. ...	284,520	36,832	321,352
Sept. ...	235,124	36,525	271,649
Total 2,673,496	394,759	3,068,255	
Oct. ...	189,278	38,189	227,467
Nov. ...	114,931	26,102	141,033
Dec. ...	108,317	28,372	136,689
Total 3,086,022	487,422	3,573,444	

## Major Industry Leaders Discuss Current Outlook

NEW YORK, Oct. 24—A broad picture of business conditions was presented today at the fifth conference of Major Industries held under the joint auspices of Columbia University and Institute of American Meat Packers.

C. F. Kettering, president of General Motors Research Corp., speaking on behalf of the automotive industry, showed its aid to other industries.

Following the conference sessions, a pioneer-in-industries dinner was held at the Hotel Astor. Guests of honor were Henry Ford, Orville Wright, George Eastman, Charles M. Schwab, Harvey S. Firestone, Julius Rosenwald and Thomas A. Edison.

## Brussels Market Steady

WASHINGTON, Oct. 25—A satisfactory automobile demand is reported in Brussels, despite the approach of the dull season, the Department of Commerce announces. Low-priced American cars in Belgium are expected to be affected by the new Citroen.



## W. R. Wilson Heads Aircraft Corporation

Named Chairman of Great  
Lakes Company Which Has  
Acquired Glenn Martin

DETROIT, Oct. 23—William Robert Wilson, recently resigned as president of Murray Corp. of America, has become chairman of the board of the Great Lakes Aircraft Corp., a new organization which has purchased the Cleveland property of the Glenn L. Martin Co., well-known as a manufacturer of planes for the United States Government.

Mr. Wilson recently became the largest single stockholder in the Henney Motor Co., Freeport, Ill. The Henney company has control of a majority of the common stock of the Great Lakes Aircraft Corp. Mr. Wilson is a member of the Board of the Henney Co., while John W. Henney is president, and Edwin R. Naar is secretary and treasurer. Other members of the board of the Heeney company include N. H. Van Sicklen, Jr., of A. B. Leach & Co., Inc.; Arthur I. Philp, formerly of Dodge Brothers, Inc., and George W. Mason, former works manager, Chrysler Corp.

The Great Lakes Aircraft Corp. will continue to manufacture Martin planes for the government as in the past, but will also develop a line of Martin designed planes for commercial work, plans being to go into production on commercial planes comparable in quality with the Martin 74 now in use by the U. S. Navy. It has acquired the physical property at Cleveland of the Glenn L. Martin Co., including the right to use designs and patents already developed by that organization. Announcement of the president and other officers of Great Lakes Aircraft Corp. will be made at a later date. Net sales of the Glenn L. Martin Co. for eight months ending Sept. 20, 1928, were \$1,511,395.

### Western Air Express Buys Fokker

NEW YORK, Oct. 25—Anthony H. G. Fokker has relinquished control of the Fokker Aircraft Corp. to a group of industrialists mainly connected with the Western Air Express. The new group plans the immediate building of the world's largest aircraft factory in California. J. A. Talbot becomes chairman of the board, and H. M. Hanshue will be president and general manager. Both are identified with the Western Air Express. Mr. Fokker will retain a large interest and will devote himself to designing and developing new types of planes. A large sales organization is planned to distribute nationally.

### Names Michigan Agent

NEW YORK, Oct. 23—Roller-Smith Co. has appointed Wise & Braisted, General Motors Building, Detroit, as sales agent in the State of Michigan.

## Mines Try Trucks to Replace Trains

KANSAS CITY, Oct. 22—Motor trucks are to be tried out as a substitute for "dinky" trains in one of the large strip mines in Kansas and if the test proves successful it is expected that many hundreds of trucks will be used for that purpose in the state. C. E. Lange, manager of the Mack-International Truck Co. branch here, has sold six 1½-ton trucks to the Pittsburg Midway Coal Co., Pittsburg, Kan., to be used in the test. The trucks are equipped with a special dump bed built by the National Steel Co. here.

## Air-Rail Line to Join New York-West Indies

NEW YORK, Oct. 23—Combined air and rail service between New York and the West Indies is to be established Jan. 10, according to an announcement made by the Atlantic Coast Line Railroad, the Florida East Coast Railway and Pan-American Airways, Inc.

Passengers from New York for the West Indies will leave the Pennsylvania station at 7:10 in the evening, arriving at Miami at 7:15 the second morning. Following breakfast at the airport they will board tri-motored air liners, arriving at Columbia Field, Havana, at 10:15 the same morning.

### Curtiss to Build New Plant

BUFFALO, Oct. 25—Curtiss Aeroplane & Motor Co., Inc., has awarded the contract for its new \$1,500,000 plant at Tonawanda, N. Y., and construction will be started in the near future. A contract for \$1,000,000 worth of military planes has been received from Chile and production will begin Nov. 1 at the plants here.

### C. A. Geiger

CLEVELAND, Oct. 25—C. A. Geiger, former president of the Troy Wagon Works Co. and a pioneer in the building of trailers, was killed in an automobile accident at Mansfield, Ohio, Oct. 7. Mr. Geiger was 69 years old and had retired from active business. He was active in the trailer business for many years achieving a leading rank as a manufacturer and as an educator in the science of transportation.

### Extends Old Car Contest

NEW YORK, Oct. 24—The National Automobile Chamber of Commerce has extended the closing time for entries in the old car contest to Nov. 15. Despite the original announcement that entries would be limited to vehicles made prior to 1900, many would-be contestants have submitted cars of later date.

## Motor & Equipment Directors Chosen

Final Details of Consolidation  
of Associations Completed  
at Convention

CHICAGO, Oct. 23—Detailed arrangements for effecting the physical merger of the Automotive Equipment Association and the Motor & Accessory Manufacturers Association, ratified by both associations in the past six months, were progressing satisfactorily here today. A tremendous amount of detail still remains for the attention of the special committees before the final approval this week.

L. A. Safford, vice-president of McQuay-Norris Co. of St. Louis, and W. S. Isherwood, sales manager, AC Spark Plug Co., Flint, are prominently mentioned for first president of the Motor & Equipment Association. Both men are eminently fitted for the position, both have been active in the affairs of the two associations and both are well acquainted with the problems of manufacturer and wholesaler.

The articles of incorporation contain the names of the following directors:

Class A—J. M. McComb, vice-president, Crucible Steel Co.; M. A. Moynihan, secretary, Gemmer Mfg. Co.; A. H. Chapin, president, Brown-Lipe-Chapin Co.; H. L. Horning, president, Waukesha Motor Co.; E. B. Clark, president, Clark Equipment Co.; C. H. Burr, SKF Industries.

Class B—L. A. Safford, vice-president, McQuay-Norris Co.; M. B. Erickson, president, Biflex Products Co.; W. T. Morris, vice-president, American Chain Co.; W. C. Hecker, president, Cur is Pneumatic Machine Co.; W. S. Isherwood, sales manager, AC Spark Plug Co.; G. L. Brunner, general manager, Brunner Mfg. Co.

Class C—A. C. Storz, Storz Western Auto Supply Co.; Elton R. Seeger, Pennsylvania Rubber & Supply Co.; Tom Glasgow, Glasgow-Stewart & Co.; E. N. Tarbell, Tarbell Watters Co., Inc.; C. B. Wright, Ballou & Wright, and R. E. Simpson, Ferris-Simpson Co.

Attendance is high and optimistic reports concerning business for the past few months and for the future are general. Harry A. Wheeler, president, Union Trust Co., Chicago, delivered an optimistic message at the opening session of the convention. He warned manufacturers and wholesalers that the necessity for frequent changes to meet the conditions imposed by present competitive conditions must be anticipated. The business exhibit in the coliseum this year is outstanding.

### Olds to Ship 6500 Units

DETROIT, Oct. 22—Oldsmobile shipments from the plant during October will approximate 6500 units. This is far in excess of the shipments for the same month in 1927.

## Ford Moves Tractor Machinery to Cork

### Irish Plant Will Meet World Requirements Including United States

DETROIT, Oct. 20—Ford Motor Co. is now busily engaged in moving its tractor plant from Detroit to Cork, Ireland, where it is expected the tractor will be again in production about Jan. 1. The Cork plant will operate on two eight-hour shifts and will have a daily output of 300 tractors. An order for \$1,000,000 worth of tractors was recently placed with the company from the Russian Soviet Government. The company also reports large orders for the tractors from Ireland, England and Continental countries of Europe, particularly Germany.

Some months ago Ford discontinued the production of Fordson tractors in order to provide more manufacturing space for the new Model "A" cars. Many rumors about the tractor division of the company have been current since that time and it is understood that when tractor production is again resumed at the Fordson plant that a new model will be introduced.

Approximately 80 per cent of the tractor manufacturing machinery is being transferred to the Cork plants. Part of the shipment is now aboard the Ford ship Lake Gorin en route to Europe. The balance is being loaded and it is expected that it will clear for Cork within a few days.

Until such time as the Ford company resumes production of tractors in the United States it is understood that Fordson tractors will be shipped from the Cork factory to America aboard returning Ford ships which are routed to Europe carrying parts for the foreign assembly plants. There is no import duty on tractors in this country.

## Delco-Remy Gets Right to Build Electrolocks

DETROIT, Oct. 20—The Delco-Remy Corp. has just acquired rights to manufacture the Electrolock, for locking automobiles. Delco-Remy with this addition, now has three locks; a coil lock, which breaks the ignition circuit inside the coil, a dual lock which locks both transmission and ignition, and the Electrolock, which breaks the ignition circuit and grounds the distributor.

The Electrolock is to be manufactured under license from the Mitchell Specialty Co. which controls the patent rights.

### Alfred B. Kreitzburg

PHILADELPHIA, Oct. 20—Alfred B. Kreitzburg, advertising manager, the Electric Storage Battery Co., died Oct. 15. Mr. Kreitzburg was 43 years old and had been ill for many months. He is survived by his wife.

## New York Approves Elevated Highway

NEW YORK, Oct. 20—Final approval of the proposed elevated express highway skirting the Hudson River waterfront of Manhattan from Canal St. to Seventy-second St., was given this week by the Board of Estimate. It is expected that this construction, together with the new marginal way required beneath it giving access to the pierheads, will cost about \$13,500,000.

## Peerless Makes Changes to Increase Production

CLEVELAND, Oct. 20—The Peerless automobile factory is being revamped preparatory to rearranging the assembly lines to make room for increased production. The rearrangement calls for large additions to the Peerless factory. These additions are already under way and are being rushed to completion. Officials of the company are taking advantage of a few days shut down, made necessary by the new construction work, to take their annual inventory, thus avoiding delay in production at a later date.

"An influx of orders on the new 1929 Six-81, and plans which are rapidly materializing for an even bigger year next year, have forced us to make the biggest change in our factory in many years," says L. R. German, president of the Peerless Motor Car Corp. "The changes will put us in a better position than we have been in for several years and will speed up production on Peerless cars," he declared.

## Australian Imports Lower

WASHINGTON, Oct. 25—Australian imports of assembled and unassembled chassis during the first half of 1928 showed a decrease of 36,831 as compared with the first half of 1927, the Department of Commerce is advised by its Melbourne office. Imports from Great Britain decreased 69 per cent and from America, 38 per cent. It is expected that for the entire year of 1928 the total imports of assembled and unassembled chassis into Australia will be about 60,000 units, a drop of 40,000 units or 40 per cent from the figures of 1927.

## Makes Spring Attachment

NEW YORK, Oct. 22—The Auto Spring Bearing Co. of Newark, N. J., is placing on the market a new ball bearing arrangement for springs in order to improve the riding qualities of automobiles. The attachment consists of a small plate bearing 16 or 32 balls which is inserted between the longer spring leaves, thus decreasing the friction which is caused as the springs react to the jolts of the road.

## Racing Board Adopts Gasoline Limit Rule

### Main European Events in 1929 Accept Plan—America Exempt for Year

PARIS, Oct. 20—International racing rules, as decided on by the International Racing Board, at its meeting held in this city Oct. 12, will be based on a limited gasoline supply. It was recognized that present-day racing cars are much too fast for safety, and the best way to cut down speed and at the same time help technical development appeared to be, in the opinion of the international board, to reduce the amount of gasoline they should consume.

In consequence, all next year's major events will be for cars weighing 1980 lb. minimum, running with an allowance of 30.8 lb. of gasoline and oil per hundred kilometers (62 miles), with a body width of 39 in. over a height of 10 in., having two seats, of which only one should be occupied, and carrying a spare wheel, minimum distance to be 370 miles. Cars built to fit these regulations ought to be capable of 80 to 100 miles an hour, according to the nature of the road.

The American delegates to the meeting—Ernest N. Smith and W. F. Bradley, of the American Automobile Association and W. S. Hogan of the A.C.A., pointed out that it was too late for the United States to adopt these racing rules for next year, and in consequence the racing board decided to maintain them for two years, with the understanding that they would be continued for a third year if they proved satisfactory.

Italy asked to organize the European Grand Prix in 1929 and selected the dates of Sept. 8 and 9. Belgium will organize this in 1930. These two races will be run under the limited gasoline rule.

The nations attending the meeting were France, Germany, England, United States, Belgium, Switzerland, Spain, Sweden, Austria and Italy. This meeting marked the first appearance of the American Automobile Association, represented by Ernest N. Smith, general manager, and by W. F. Bradley. At the close of the meeting René de Knyff, who has been chairman of the International Racing Board for 25 years, announced his intention of retiring. His successor has not yet been appointed.

## Navy to Auction Parts

WASHINGTON, Oct. 24—The Navy Department announces the sale of 3,650,000 lb. of automobile parts and other ferrous metals, including electrical material; screws, bolts, etc., to be auctioned at the Boston Navy Yard on Oct. 31. Conditions and terms of the sale, with catalog (No. 640-A) may be had either from the department here or the Boston yard.



## Traffic Resentment of Signals Feared

### Engineering Conference De- clares Some Cities Erring in Installing Systems

WASHINGTON, Oct. 25—Some cities are making fundamental errors in installing traffic signs, signals and markings. This warning is contained in a report of the American Engineering Conference, just completed as a result of a survey of more than 100 cities located in 35 states, in cooperation with the National Conference on Street and Highway Safety.

The two fundamental errors by some cities pointed out in the report were placing traffic control devices without adequate study of conditions and employing such devices at places and times not justified by conditions. The report contends that the result will be a public recognition of the errors and a neglect or unfriendliness toward street traffic signs, signals and markings, and cities are urged to avoid such mistakes by consulting engineering advice before establishing any system.

Among recommendations in the report are some for standardizing traffic signs. For railroad crossings two arms mounted across each other inclined to form a cross buck, about 15 ft. from the crossing, is suggested; lettering to be black on a white background. For the approach warning at railroad crossings a circular sign is suggested about 2 ft. in diameter; divided into quadrants with the letter R on each of the upper quadrants, placed 100 ft. or more from the crossing.

"Stop" signs are recommended to be octagonal, 18 or 24 in. in outside diameter with the word in 5 in. letters, in red on a yellow background. "Slow" signs are recommended to be diamond shaped.

#### To Revise New York Code

NEW YORK, Oct. 20—Consideration of a projected revision of the New York State highway motor vehicle code was brought about this week at the annual convention of the New York State Automobile Association in Hotel Pennsylvania by a paper delivered by William P. Capes, executive secretary of the Conference of Mayors.

The present code was established in 1917 and although some revisions have been made since then it is pointed out that many of the regulations which are included are now obsolete or have been superseded by local conditions.

#### J. Walter Thompson

NEW YORK, Oct. 20—James Walter Thompson, founder of the advertising firm which bears his name, died at his home, 11 East Sixty-eighth St., this week as the result of a stroke suffered two weeks ago. He was nearly 81 years old. He is survived by his widow and a son, Walter Roosevelt Thompson.

### Indian to Promote Motorcycle Clubs

SPRINGFIELD, MASS., Oct. 22—A countrywide campaign for expansion of motorcycling activities by the promotion of motorcycle clubs was launched here Oct. 17 at a dinner given by the Indian Motorcycle Co. to officials of the American Motorcycle Association and attended by factory executives and salesmen. An organization of state and local units, with committees, will be developed and tours, outings and races arranged.

## M. & A.M.A. Index 202 for September

NEW YORK, Oct. 22—Manufacturing in parts and accessories during September showed a seasonal decline, according to figures just made public by the Motor & Accessory Manufacturers Association, but in all branches this business has continued ahead of business a year ago.

Business in replacement parts has even shown an advance over August business while other groups and the grand index for the whole group showed a decline. The index for September, 1928, in replacement parts, based on January, 1925, as 100 was 185. This compares with 176 in August and with 181 in September a year ago.

Index for original equipment is 218 as compared with 230 for August and 139 in 1927.

Accessories showed an index of 122 for September as compared with 147 in August and 163 in September a year ago.

Service equipment index is 140 as compared with 148 for August and 127 last year.

Grand index for the entire industry is 202 and compares with 212 in August and with 146 for September, 1927.

### Durant Increases Output

NEW YORK, Oct. 22—Durant Motors, Inc., is now in a position to make delivery of its four-cylinder and Series 60 de luxe sedans. Immediately following the announcement of these models the orders were received so rapidly that it was impossible to supply the demand for these particular models. Production has now been stepped up, however, to such a point that these orders can be filled.

### Aden Favors American Cars

WASHINGTON, Oct. 25—Two-thirds of the 1928 automobiles in the 11 small countries constituting the Consular District of Aden, Arabia, are of American origin, the Department of Commerce is advised. Quality of passenger cars there has recently risen.

## French Registration Now Exceeds Million

### Now One Car for Every 41 Inhabitants—Paris Reg- isters 103,307

PARIS, Oct. 20—France passed the million mark in automobile registrations this year, with one car for 41 inhabitants, the industry occupied seventh place in national exports, and the number of cars exported was 52,053, or 27 per cent of the total production, according to French "Facts and Figures" just published by Michelin on the same lines as the National Automobile Chamber of Commerce booklet.

The number of workers employed in the industry is estimated at 200,000. There are 390,000 miles of made highway, or 15 times more than the length of railroad tracks, and the density of these roads (length per square mile of country) is the highest in the world. The city possessing the greatest number of automobiles is Paris, which has 103,307, or one for 28 inhabitants. Nancy and Nice each possess one car for 13 inhabitants.

### Pneumatic Tired-Wheels

#### Aided by Tax in Spain

WASHINGTON, Oct. 25—Increased taxation on solid tires for trucks and improvement in quality of pneumatic truck tires are basic causes for a Spanish trend toward the inflated tires and wheels for them, according to advice from Bilbao to the Department of Commerce.

The department is advised that truck operators are showing a steadily increasing desire to change over from solid tires to pneumatics and as a result from solid-tire wheels to pneumatic-tire wheels. Disk wheels are especially favored, and these wheels with rims of the following sizes are said to be finding good conditions in the market: 32 x 6; 34 x 7; 38 x 7; 36 x 8; 40 x 8; 38 x 9. If American producers can compete in price with other producers selling in this market they are practically assured an increasing business. Preponderance of American cars on the Spanish market paves the way for quick acceptance of American automobile accessories.

### 3000 Years for Thefts

WASHINGTON, Oct. 24—During the fiscal year ending June 30, 1928, a total of 2055 persons were convicted under the Dyer automobile motor theft act, the Department of Justice announces. These convictions for transporting stolen automobiles interstate netted penalties of 3000 years and \$50,153 in fines. During the year 3455 stolen automobiles were recovered valued at \$2,391,371. Since the life of the act from 1919 to date 17,702 stolen automobiles valued at \$14,391,000 have been recovered, the department announces.

# Men of the Industry and What They Are Doing

## American Cars Setting Styles, Asserts Mooney

American automobiles are today establishing a criterion not only in performance but in beauty as well, according to J. D. Mooney, president of General Motors Export Co., who returned Oct. 22 on the S.S. Leviathan from a European trip during the course of which he visited the Paris and London salons.

"A few years ago," he said, "it was the European vehicle that set the style. Today it is definitely the American car that establishes the criterion of beauty as well as performance."

The automobile industry has only begun to supply the need of the world for passenger cars and trucks, in Mr. Mooney's opinion. He said that he feels that the surface of the world market has hardly been scratched, and that American manufacturers are just beginning to comprehend the full potentialities of the market.

General Motors Corp. is expanding its facilities abroad in order to fill the demand for cars that he feels is bound to come. New plants are being built and the dealer organization is being increased and refined.

Sales of General Motors abroad in 1928 will total over \$260,000,000. That company did more business overseas in May of this year than it did in the whole of 1922.

## Hunt and Phillips Return

John S. Hunt, general manager of the Durant Motor Co. of New Jersey, and Carl M. Phillips, chief body engineer, who have been spending about six weeks in Europe, have returned. Mr. Hunt and Mr. Phillips, while in Europe, conferred with Mr. Durant, who is still over there, with regard to the new plant in Germany and also inspected some of the other European automotive plants. While abroad they attended the Paris and London automobile shows.

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Alexis de Sakhnoffsky has been engaged by Hayes Body Corp. as art director. He has resigned from Van Den Plas, coach builders of Brussels and will accompany Roy T. Anderson, vice-president and chief engineer, back from abroad. In Europe he had received many awards for beauty in car design at salon exhibits.

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Comdr. Bruce G. Leighton, who resigned recently from the bureau of aeronautics, Navy Department, to join Wright Aeronautical Corp., has been appointed director of sales and service of the Wright corporation.

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## Joins Commerce Department

Harry H. Steidle has been appointed assistant chief business specialist in the commercial standards unit of the Bureau of Standards, U. S. Department of Commerce. Mr. Steidle was at one time associated with the national committee on wood utilization of the Department of Commerce.

## Smith and Kingston Named to New Boston Hose Posts

At a meeting of the board of directors of the Boston Woven Hose & Rubber Co., Oct. 15, J. Newton Smith was elected president of the company and reelected to the office of treasurer. Mr. Smith has been identified with the company for a number of years as vice-president and treasurer. He succeeds G. E. Hall who died recently.

At the same meeting Arthur C. Kingston was elected a vice-president. Mr. Kingston was formerly director of sales and will continue the active direction of sales policies as well as assuming the added duties of his new position.

## Benhoff Named Commodore

August Benhoff, general parts manager of the Willys-Overland Co., has been elected commodore of the Toledo Yacht Club. Several other men of prominence in automobile business in Toledo are subordinate officers of the club. George M. Bender of the Union Supply Co. is treasurer; E. T. Affleck of the Electric Auto-Lite Co. is delegate to the Inter-Lake Yachting Association.

## Thies Sales Manager

H. R. Thies has been appointed general sales manager of the Hutto Engineering Co., Detroit, and will have charge of service, production and export sales. M. C. Hutto, president, who has just returned from Europe, reports portable cylinder grinding equipment now largely used for resizing worn engine bores.

## Mainguy Montreal Manager

P. N. Mainguy has been appointed manager of the Montreal branch of the Ford Motor Co. of Canada, Ltd. Mr. Mainguy is one of the oldest executives of the company. He has been manager of the London branch since 1924 and prior to that date he had charge of the export sales in the home office at Ford City. He joined the company in 1915.

## Stoddard Opens Office

E. J. Stoddard, who was formerly connected with the patent law firm of R. A. Parker, which defended the Ford Motor Co. in the Selden patent suit, has established a law office of his own in the Ford Building, Detroit, and expects to specialize in patent, trade mark, copyright and unfair competition cases.

## Dr. Anderson Back From Europe

Dr. Robert J. Anderson, vice-president of the Fairmont Mfg. Co., Fairmont, W. Va., has returned after an extended trip through Europe. He visited a number of the principal aluminum plants abroad and made a study of the foreign aluminum situation.



## Hudson Net Income \$3,121,632 in Quarter

Reports by Leading Car and  
Parts Makers Show High  
Earnings

NEW YORK, Oct. 20—Hudson Motor Car Co. reports net income for the third-quarter of the current year after all charges as \$3,121,632. This is equivalent to \$1.95 a share and compares with \$4,224,973, or \$2.65 a share for the corresponding quarter of 1927. Net income for the nine months ended Sept. 30 was \$12,337,953, or \$7.72 a share, as compared with \$14,042,536, or \$8.79 a share, for the corresponding quarter of 1927.

### Johns-Manville

Johns-Manville Corp. and subsidiary companies report net profit of \$1,722,451 for the third quarter, equivalent to \$2.12 a share on common stock and comparing with \$1,600,438 in the preceding quarter. Net profit in the nine months ended Sept. 30 was \$4,095,595 after all charges and Federal taxes.

### American Bosch

American Bosch Magneto Corp. reports net profit of \$362,921 for the nine months ended Sept. 30 after charges but before Federal taxes. This compares with \$195,314 in the first nine months last year. Profit for the September quarter was \$259,467 before Federal taxes as against \$32,178 in the preceding quarter and \$114,848 in the same quarter last year.

### Bendix Corp.

Bendix Corp. reports net income of \$2,120,696 after charges and Federal taxes in the nine months ended Sept. 30, equivalent to \$4.71 a share on the 450,000 shares of capital stock. Earnings in the full year 1927 were \$674,460.

### Reo Motor Car

Reo Motor Car Co. reports earnings of \$1,543,511 in the quarter ended Sept. 30, equivalent to 77 cents a share on common stock. This compares with net profit of \$3,104,633 in the preceding quarter and with net loss of \$86,489 in the first quarter. Nine months earnings total \$4,651,656, equal to \$2.28 a share. Earnings in the full year 1927 were \$4,071,608.

### Allis-Chalmers

Allis-Chalmers Mfg. Co. reports earnings of \$743,623 in the quarter ended Sept. 30, equivalent to \$2.86 a share on common. This compares with 804,407 in the preceding quarter and with \$776,709 in the third quarter last year. Net profit for the first nine months was \$2,223,631, equal to \$8.55 a share, and comparing with \$2,458,859 in the same period last year. Unfiled orders on hand Sept. 30 totaled \$9,965,764 as against \$11,182,568 on the same date last year.



### Higher With Moon

Helm Walker has been appointed a vice-president of Moon Motor Car Co., in charge of sales and advertising. He was previously manager of the Moon factory branch in Chicago

## Guide Motor Lamp Purchased by G.M.

ROYAL OAK, MICH., Oct. 23—A further expansion of General Motors Corp. in the parts field is foreseen as a result of the purchase by the corporation of the Guide Motor Lamp Co. of Cleveland. The Guide company, which is one of the pioneers in the lamp field does a \$3,000,000 business annually and supplies several well known automobile manufacturers.

Stockholders of the lamp company voted to accept \$913,690 for their holdings. They are to receive \$175 a share for the common and \$110 for the preferred plus accrued dividends for 30 days. According to H. J. Monson, president of the Guide company, General Motors plans to operate the company with its present personnel.

## Chrysler Has Record Month

WINDSOR, ONT., Oct. 23—September was the greatest month in the entire history of the Chrysler Corp. of Canada, Ltd., says R. H. Mulch, sales manager. During September the shipments of Chrysler-built cars set a new high monthly record for all previous years.

### Burton S. Gier

DETROIT, Oct. 22—Burton S. Gier, 61, Lansing, founder of the Gier Pressed Steel Co., and director of the Motor Wheel Corp., of which the pressed steel plant later became a unit, died at the Mayo sanitarium, Oct. 19.

## Financial Notes

Commercial Credit Co. reports net income for the third quarter of 1928 after all charges as \$1,208,656. This is equivalent after preferred dividends to \$1.27 a share on its 680,000 shares of no par common stock, and compares with a net income of \$760,962, or \$1.11 a share, in the preceding quarter and with \$358,125, or 52 cents a share, for the corresponding quarter of 1927. Net income for the nine months ended Sept. 30 was \$2,973,801, equivalent, after preferred dividends, to \$2.82 a share. This compares with net income on common stock of \$460,578, or 67 cents a share, for the corresponding period of 1927.

Mullins Mfg. Co. reports earnings of \$266,674 in the quarter ended Sept. 30, comparing with \$237,878 in the preceding quarter and with \$201,332, before Federal taxes in the third quarter last year. For the first nine months this year earnings were \$742,590 after charges but before Federal taxes as against \$523,712 in the same period last year.

Rich Tool Co. units of stock, consisting of one share of Class A convertible preferred and one-half share of Class B common, are being offered at \$46.50 a unit. A total of 75,000 units are offered, the stock representing purchases from individual shareholders. No company financing is involved.

Lahey Foundry & Machine Co. reports earnings in September in excess of \$100,000. Net profit for the fiscal year ending Oct. 31 is expected to approximate \$900,000, equivalent to more than \$3 a share on the 286,000 no par shares outstanding. Net income in the year ended Oct. 31, 1927, was \$480,182.

Evans Auto Loading Co., Inc., reports its consolidated net income for the first nine months this year as \$730,452 before Federal taxes. Net income after taxes was \$642,798 against \$512,430 in the same period last year.

Vanadium Corp. has declared regular dividend of 75 cents payable Nov. 15 to holders of record Nov. 1 and an extra dividend of \$1 payable Dec. 15 to holders of record Dec. 1.

Wire Wheel Corp. of America has declared an initial dividend of \$1 and an extra dividend of \$2, both payable Dec. 15 to holders of record Dec. 1.

Heywood Starter Corp., New York, which has developed a starter for airplanes, has issued 15,000 shares of common stock at \$12.50 a share.

## Form Zenith Airplane

MILWAUKEE, Oct. 23—Milwaukee Zenith Airplane Corp. has been formed with A. W. Sieglaff as president and general manager to manufacture twin-engined Zenith airplanes selling at \$3,500. The planes will carry four passengers and will have safety wings and a special safety parachute to carry the entire plane will be sold at an extra charge. Zenith carburetors will be used.

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## Benhoff Named Commodore

August Benhoff, general parts manager of the Willys-Overland Co., has been elected commodore of the Toledo Yacht Club. Several other men of prominence in automobile business in Toledo are subordinate officers of the club. George M. Bender of the Union Supply Co. is treasurer; E. T. Affleck of the Electric Auto-Lite Co. is delegate to the Inter-Lake Yachting Association.

## Thies Sales Manager

H. R. Thies has been appointed general sales manager of the Hutto Engineering Co., Detroit, and will have charge of service, production and export sales. M. C. Hutto, president, who has just returned from Europe, reports portable cylinder grinding equipment now largely used for resizing worn engine bores.

## Mainguy Montreal Manager

P. N. Mainguy has been appointed manager of the Montreal branch of the Ford Motor Co. of Canada, Ltd. Mr. Mainguy is one of the oldest executives of the company. He has been manager of the London branch since 1924 and prior to that date he had charge of the export sales in the home office at Ford City. He joined the company in 1915.

## Stoddard Opens Office

E. J. Stoddard, who was formerly connected with the patent law firm of R. A. Parker, which defended the Ford Motor Co. in the Selden patent suit, has established a law office of his own in the Ford Building, Detroit, and expects to specialize in patent, trade mark, copyright and unfair competition cases.

## Dr. Anderson Back From Europe

Dr. Robert J. Anderson, vice-president of the Fairmont Mfg. Co., Fairmont, W. Va., has returned after an extended trip through Europe. He visited a number of the principal aluminum plants abroad and made a study of the foreign aluminum situation.



## Hudson Net Income \$3,121,632 in Quarter

### Reports by Leading Car and Parts Makers Show High Earnings

NEW YORK, Oct. 20—Hudson Motor Car Co. reports net income for the third-quarter of the current year after all charges as \$3,121,632. This is equivalent to \$1.95 a share and compares with \$4,224,973, or \$2.65 a share for the corresponding quarter of 1927. Net income for the nine months ended Sept. 30 was \$12,337,953, or \$7.72 a share, as compared with \$14,042,536, or \$8.79 a share, for the corresponding quarter of 1927.

#### Johns-Manville

Johns-Manville Corp. and subsidiary companies report net profit of \$1,722,451 for the third quarter, equivalent to \$2.12 a share on common stock and comparing with \$1,600,438 in the preceding quarter. Net profit in the nine months ended Sept. 30 was \$4,095,595 after all charges and Federal taxes.

#### American Bosch

American Bosch Magneto Corp. reports net profit of \$362,921 for the nine months ended Sept. 30 after charges but before Federal taxes. This compares with \$195,314 in the first nine months last year. Profit for the September quarter was \$259,467 before Federal taxes as against \$32,178 in the preceding quarter and \$114,848 in the same quarter last year.

#### Bendix Corp.

Bendix Corp. reports net income of \$2,120,696 after charges and Federal taxes in the nine months ended Sept. 30, equivalent to \$4.71 a share on the 450,000 shares of capital stock. Earnings in the full year 1927 were \$674,460.

#### Reo Motor Car

Reo Motor Car Co. reports earnings of \$1,543,511 in the quarter ended Sept. 30, equivalent to 77 cents a share on common stock. This compares with net profit of \$3,104,633 in the preceding quarter and with net loss of \$86,489 in the first quarter. Nine months earnings total \$4,651,656, equal to \$2.28 a share. Earnings in the full year 1927 were \$4,071,608.

#### Allis-Chalmers

Allis-Chalmers Mfg. Co. reports earnings of \$743,623 in the quarter ended Sept. 30, equivalent to \$2.86 a share on common. This compares with 804,407 in the preceding quarter and with \$776,709 in the third quarter last year. Net profit for the first nine months was \$2,223,631, equal to \$8.55 a share, and comparing with \$2,458,859 in the same period last year. Unfiled orders on hand Sept. 30 totaled \$9,965,764 as against \$11,182,568 on the same date last year.



#### Higher With Moon

Helm Walker has been appointed a vice-president of Moon Motor Car Co., in charge of sales and advertising. He was previously manager of the Moon factory branch in Chicago.

## Guide Motor Lamp Purchased by G.M.

ROYAL OAK, MICH., Oct. 23—A further expansion of General Motors Corp. in the parts field is foreseen as a result of the purchase by the corporation of the Guide Motor Lamp Co. of Cleveland. The Guide company, which is one of the pioneers in the lamp field does a \$3,000,000 business annually and supplies several well known automobile manufacturers.

Stockholders of the lamp company voted to accept \$913,690 for their holdings. They are to receive \$175 a share for the common and \$110 for the preferred plus accrued dividends for 30 days. According to H. J. Monson, president of the Guide company, General Motors plans to operate the company with its present personnel.

## Chrysler Has Record Month

WINDSOR, ONT., Oct. 23—September was the greatest month in the entire history of the Chrysler Corp. of Canada, Ltd., says R. H. Mulch, sales manager. During September the shipments of Chrysler-built cars set a new high monthly record for all previous years.

#### Burton S. Gier

DETROIT, Oct. 22—Burton S. Gier, 61, Lansing, founder of the Gier Pressed Steel Co., and director of the Motor Wheel Corp., of which the pressed steel plant later became a unit, died at the Mayo sanitarium, Oct. 19.

## Financial Notes

Commercial Credit Co. reports net income for the third quarter of 1928 after all charges as \$1,208,656. This is equivalent after preferred dividends to \$1.27 a share on its 680,000 shares of no par common stock, and compares with a net income of \$760,962, or \$1.11 a share, in the preceding quarter and with \$358,125, or 52 cents a share, for the corresponding quarter of 1927. Net income for the nine months ended Sept. 30 was \$2,973,801, equivalent, after preferred dividends, to \$2.82 a share. This compares with net income on common stock of \$460,578, or 67 cents a share, for the corresponding period of 1927.

Mullins Mfg. Co. reports earnings of \$266,674 in the quarter ended Sept. 30, comparing with \$237,878 in the preceding quarter and with \$201,332, before Federal taxes in the third quarter last year. For the first nine months this year earnings were \$742,590 after charges but before Federal taxes as against \$523,712 in the same period last year.

Rich Tool Co. units of stock, consisting of one share of Class A convertible preferred and one-half share of Class B common, are being offered at \$46.50 a unit. A total of 75,000 units are offered, the stock representing purchases from individual shareholders. No company financing is involved.

Lakey Foundry & Machine Co. reports earnings in September in excess of \$100,000. Net profit for the fiscal year ending Oct. 31 is expected to approximate \$900,000, equivalent to more than \$3 a share on the 286,000 no par shares outstanding. Net income in the year ended Oct. 31, 1927, was \$480,182.

Evans Auto Loading Co., Inc., reports its consolidated net income for the first nine months this year as \$730,452 before Federal taxes. Net income after taxes was \$642,798 against \$512,430 in the same period last year.

Vanadium Corp. has declared regular dividend of 75 cents payable Nov. 15 to holders of record Nov. 1 and an extra dividend of \$1 payable Dec. 15 to holders of record Dec. 1.

Wire Wheel Corp. of America has declared an initial dividend of \$1 and an extra dividend of \$2, both payable Dec. 15 to holders of record Dec. 1.

Heywood Starter Corp., New York, which has developed a starter for airplanes, has issued 15,000 shares of common stock at \$12.50 a share.

## Form Zenith Airplane

MILWAUKEE, Oct. 23—Milwaukee Zenith Airplane Corp. has been formed with A. W. Sieglaff as president and general manager to manufacture twin-engined Zenith airplanes selling at \$3,500. The planes will carry four passengers and will have safety wings and a special safety parachute to carry the entire plane will be sold at an extra charge. Zenith carburetors will be used.

## Macauley Proposes Promotion Activity

Seeks European Support of  
International Program to  
Promote Sales

PARIS, Oct. 20—Responding to a private invitation of Alvan Macauley, president of the National Automobile Chamber of Commerce and president of the Packard Motor Car Co., 16 automobile manufacturers representing the United States, France, Germany, England, Italy and Belgium, met at the Hotel Plaz Athenee, in this city, for a round table talk on international sales promotional work. The conference, which was informal, and taken on the personal initiative of Mr. Macauley, was followed by a dinner.

France was represented by André Citroen and M. Guillelmon, replacing Louis Renault, who stated that he was unable to come. Sir Herbert Austin, who assisted Mr. Macauley considerably in getting the meeting together, attended with J. D. Siddeley as representatives of the British industry. The German firms represented were Mercedes-Benz, Adler and Opel; Italy had Fiat, Alfa Romeo and Itala delegates present, and the Belgians were Minerva, Imperia-Excelsior and F. N. In addition to the chairman the Americans present were John N. Willys, Harry Tipper, H. H. Kelly and George Bauer.

Mr. Macauley outlined the promotional work which had been carried out in the United States and expressed the opinion that these same methods could be given a world-wide application through some such organization as the Bureau Permanent. As at present constituted, this bureau does not possess the necessary machinery for the execution of a propaganda program, but it could be strengthened in order to carry out this work.

While some of the delegates, notably André Citroen and Sir Herbert Austin, promised their full support to the general scheme outlined by Mr. Macauley, others were lukewarm and in certain cases there was direct opposition to any joint action. The meeting was adjourned without any definite plan of action having been decided on, but with the understanding that the delegates would meet at a later date.

### N. C. Sales Total 44,363

RALEIGH, N. C., Oct. 20—Although the Ford has led in new car sales in North Carolina for the past two months, Chevrolet continues to lead in total new car sales for the first nine months of the year, according to figures made public by the state automobile bureau. Total new sales for the first nine months in North Carolina are 44,363 cars, compared with 44,961 for the first nine months of last year. Officials of the department believe that this year's sales will pass last year's before the end of the year.

## "Roughometer" Device Counts Road Bumps

WASHINGTON, Oct. 20—A "Roughometer" designed to measure the roughness of road surfaces has been perfected by the Bureau of Public Roads, and is being adopted by many states, according to the Department of Agriculture. The instrument is based on the principle that the amount of spring deflection of an automobile bears a direct relation to the degree of roughness of the road. The recorder gives the total amount of spring compression in inches for any given distance, and a comparison of records obtained on different roads permits a relative estimate of their roughness.

## Muskegon Piston Ring Erects Plant Addition

DETROIT, Oct. 20—Contracts are being let for a new building which will nearly double the size of the Muskegon Piston Ring Co. at Muskegon, Mich. The addition, one story high and 80 by 160 ft., will be built adjacent to the present plant.

Business of the company has shown a remarkable growth during the past year with the result that the capital structure has been increased. The company has signed a contract with one of the leading automobile manufacturers for the production of service piston rings until July 1, 1929. Another leading automobile manufacturer, who plans a substantial increase in production, has placed orders for additional piston rings.

## Loening Gets Army Order

NEW YORK, Oct. 20—Loening Aeronautical Engineering Corp., whose merger with the Keystone Aircraft Corp. of Bristol, Pa., was announced this week, has been awarded a contract by the U. S. Army air service for eight of its recently developed observation type amphibian planes. It is understood that these planes will be powered with a new air-cooled, eight-in-line engine. Further details about this power plant have not yet been given out.

## Fokker Awards Rights

NEW YORK, Oct. 20—Fokker Aircraft Corp. has just made arrangements for two foreign representations. A. V. Row, Ltd., of Manchester, Eng., has been granted manufacturing rights of the Fokker commercial aircraft for Great Britain and the British possessions, with the exception of Canada. Canadian rights have been granted under contract to Canadian Vickers, Ltd., of Montreal, the oldest and largest aircraft factory in the country.

## Hershey Corporation Combines Companies

Takes Over Hershey Mfg. and  
Tire Carrier Division of  
Kelvinator

DETROIT, Oct. 20—Organization of the Hershey Corp. to acquire the capital stock on all the assets and business, including good will of the Hershey Mfg. Co. of Chicago, a Colorado corporation, and the inventory and physical properties of the Tire Carrier Division of the Kelvinator Corp., has just been effected. Claire L. Barnes, who is president of the Oakes Products Corp., also becomes president of the new Hershey corporation. J. C. Hershey becomes vice-president and general manager.

The Hershey company is manufacturing at the present time the Hershey coincidental lock, which locks with one operation both the ignition and the steering wheels on automobiles. The Tire Carrier Division of Kelvinator is manufacturing a varied line of automobile tire carriers, and parts for the Kelvinator refrigeration unit.

### Flint Foundries Merge

DETROIT, Oct. 20—Merger of three Flint foundry companies into the General Foundry Machine Co. has just been completed. The companies combined into the new organization are the Flint Foundry Co., Flint Malleable Casting Co., and the General Foundries. The principal customers of the plants include several units of the General Motors Corp., the Chrysler Corp., and the Marvel Carburetor Co.

Officers of the new company are J. M. Barringer, president; Carl W. Bonbright, vice-president; Edwin W. Atwood, treasurer, and R. W. Perry, secretary.

The Flint Foundry Company has been operating for a number of years maintaining plants both in Flint and in Marshall, Mich. A custom pattern shop is operating in addition to its casting business. The Flint Malleable Casting Co. and General Foundries owns plants in Flint. Operations of both the latter companies are similar and it is planned to combine the plants at the location of the General Foundries. Additions have been made to both plants and a finishing shop with facilities for galvanizing and machining is now in process of construction. The value of the new company's holdings has been placed at \$600,000.

## Reorganize Columbia Tire

PORTLAND, ORE., Oct. 20—The reorganized Columbia Tire Corp., now known as the CTC Tire & Rubber Co., will be operating to capacity on Nov. 1. C. W. Brown, formerly coast manager for Springfield-Kelly, is the new sales manager. J. F. Cullen is president and plant manager of the reorganized company. H. A. Ketterman is secretary-treasurer.



## U. S. Chamber Votes Aid to Agriculture

### Seven Recommendations by Committee to Help Farm Problem Adopted

WASHINGTON, Oct. 20—The Chamber of Commerce of the United States announced this week the completion of a referendum on agriculture, the results of which put the organization on record in favor of a series of seven propositions with respect to American agriculture.

The vote of the Chamber's member organizations was on the report of the chamber's special committee on agriculture, which made recommendations after a long study and after going over the work of earlier committees and of the business men's commission on agriculture set up jointly by the chamber and the National Industrial Conference Board.

The seven recommendations of the committee as they appeared on the ballot were:

I. Strict coordination of land, reclamation, and reforestation policies of the federal government.

II. Postponement of further reclamation projects until demonstration of need for the additional production.

III. That the national chamber expressly declare that its advocacy of reasonable protection for American industries subject to destructive competition from abroad and of benefit to any considerable part of the country is applicable to agriculture.

IV. That cooperative marketing of agricultural products should be supported and that producers of agricultural commodities should be encouraged to form cooperative marketing associations along sound economic lines.

V. That agricultural credit requirements be met through full development and adaptation of existing facilities.

VI. Creation of a federal farm board, to report its recommendations to Congress.

VII. Adequate federal appropriations for economic and scientific agricultural research by the Department of Agriculture.

## Dodge Assembly Planned

OAKLAND, CAL., Oct. 22—Chrysler Corp. announces that its proposed \$7,000,000 factory branch here, recently disclosed, will be planned to permit of Dodge assembly and distribution in the plant. An office will be opened shortly on the site of the buildings, from which details of the construction program will be worked out.

## Griswold Sales \$500,000

DETROIT, Oct. 22—The Griswold Motor Body Co. report a total volume of sales of over \$500,000 for the period ending Sept. 30. The company is in excellent financial condition. Among the clientele are Chrysler, Graham-Paige, Jordan and several custom accounts.

## Ohio Parts Adds Building

DETROIT, Oct. 20—The Ohio Parts Co., Cincinnati, pressed for additional

space by expansion in battery cable and terminal business and by the acquisition of the "MIHO" line of electrical charging and testing equipment, is erecting a five-story reinforced concrete structure, with approximate floor space of 52,000 sq. ft. The new building which adjoins the foundries will contain the assembly departments as well as offices.

## Chrysler to Expand Evansville Factory

EVANSVILLE, IND., Oct. 20—Building improvements that will double or treble the production capacity of the Graham Brothers division plant here were announced by K. T. Keller, vice-president in charge of production, Chrysler Corp., who with other executives inspected the local plant this week.

The Chrysler announcement was made at a dinner at the Hotel McCurdy for Mr. Keller, J. E. Fields, vice-president in charge of sales, and W. E. Hurley, general manager of the Evansville, Ind., and Stockton, Cal., Graham Brothers division plants. A. E. Cooney, general manager of the Evansville plant, was toastmaster at the dinner.

## Duesenberg at Capacity

CHICAGO, Oct. 25—Duesenberg, Inc., subsidiary of the Auburn Automobile Co., has on hand orders sufficient to keep its plant at Indianapolis in full operation until April 1, 1929. Company has just placed orders with several coach builders amounting to \$80,000 for automobile bodies to be exhibited on Duesenberg chassis at New York and Chicago salons.

## Auburn Has 869 Dealers

CHICAGO, Oct. 22—Auburn Automobile Co. had a total of 869 dealers as of Oct. 15, compared with 632 at the same time in 1927, according to R. H. Faulkner, vice-president and director of sales.

## Southern Pacific and Draymen's Association Arrange New Plan for Terminal Deliveries

SAN FRANCISCO, Oct. 25—The San Francisco Draymen's Association and the Southern Pacific Railway Co. are reported to have come to an agreement which has resulted in the formation of a new corporation and which will take considerable business from the long-distance-hauling trucks and give it to the railway and to draymen at each end of the line.

Freight rates between San Francisco and Santa Cruz, Monterey, Salinas and Watsonville, from 85 to 125 miles distant, are expected to be materially changed. Much of the freight business between these points for a long period has been hauled by motor trucks, to the detriment of the railroad and the drayage concerns at either end of the line.

In connection with the agreement a new organization, the Federated Ter-

## Battery Association Plans Standard Tests

### Activities Will Include Adoption of Uniform System of Accounting

CHICAGO, Oct. 20—Uniform standards for testing batteries and a uniform system of cost accounting will be two of the activities of the National Battery Manufacturers Association during the coming year, it was said today by Ward S. Perry, president of Vesta Battery Corp., recently elected president of the association.

Mr. Perry said it would be also the policy of the association to make every effort to increase active membership in the association; to compile and distribute statistics concerning the industry which are now lacking; to conclude the work of the data book committee and encourage the adoption of a uniform data book by the membership as a whole.

"Adoption of such a data book," said Mr. Perry, "will mean not only the saving of thousands of dollars on the part of the membership by eliminating duplicate effort, but will assist materially in the merchandising and sale of batteries to the trade."

"Uniform test standards will be particularly valuable view of the fact that developments during the next few years in the battery industry will undoubtedly introduce marked increases in battery efficiency."

"Selling and distribution costs are one of the biggest problems confronting industries of all kinds. As these matters undoubtedly will be discussed at length by our membership it is highly desirable that all members speak the same language so that a uniform system of cost accounting will be valuable," he declared.

minals Company, has been formed to handle the drayage at each end. It has a capital stock of \$50,000 and has been granted a permit by the state corporation commissioner to sell \$20,000 worth of stock.

The new rates, it is said, will be higher than the present ones for long-distance truck hauling, but lower than the present ones of the railway company.

In addition to its expected efficiency, the new combination proposes to appeal for business on the ground that the old truckmen spent no money in the various outside termini, making San Francisco their headquarters, while the draymen in the various towns, under the new arrangement, will be permanent residents there and will keep the money in circulation where they live.

## Hupp Adopts Plan for Used Car Sales

Adopts Symbol to Guarantee  
Better Type Vehicles to  
Purchaser

DETROIT, Oct. 22—"Hupp-Mark" is the symbol which the Hupp Motor Car Corp. has adopted for its dealer organization to designate a type of used cars which will be merchandised under the "Hupp-Mark" program. It is not intended to have the Hupp-Mark on all used cars as its indiscriminate use would depreciate the value of the symbol. It will be placed only on cars that represent unusual value by reason of condition, appearance, make and price.

The new symbol is described as a red square on a blue Roman cross. Inside the square are the words "Hupp-Mark" in the form of a circle. On the arms of the cross appear the words, "Used Car," "Value," "Quality" and "Protection."

"Cars which bear the Hupp-Mark will be the flower of the used car field," says a company bulletin. "Hupmobile dealers have this year received a large number of fine motor cars in trade on new Century sixes and eights. The best of these have been selected and set aside to bear the new symbol. Some of them are practically new. All of them have been made like new by thorough inspection and reconditioning. They will be sold under the Hupp-Mark as the dealer's pledge of their value."

"All cars selected to bear the Hupp-Mark are offered in sound mechanical condition. They are road-tested, checked and priced to assure owner satisfaction in mileage—anywhere from 10,000 to 100,000 miles."

## Bus Operation Per Seat Less Than Passenger Car

WASHINGTON, Oct. 25—It costs 2.6 per seat for every mile a private automobile is operated while a bus operates for 1.1 cent per mile per seat, based on 1927 figures, according to the American Automobile Association's bus division.

A statement made public by the A.A.A. bus division, based upon a study of motor bus operating costs on the lines of 66 companies carrying more than 400,000,000 passengers at an average fare of 10.1 cents per passenger, shows that the miles of route covered by the common carrier bus exceeds by 5 per cent the route mileage of railroads and by 463 per cent that of electric railways.

## Chevrolet Exports Gain

DETROIT, Oct. 23—During the first six months of this year General Motors Export Co. reports the sale of 57,808 Chevrolet passenger cars and 50,542 trucks as compared with 38,594 passenger cars and 32,799 trucks for the first six months of 1927.



**Heads Hudson Sales**

Courtney Johnson, named successor to R. T. Romine as sales manager of Hudson Motor Car Co.

## Johnson is Named Hudson Sales Head

Will Succeed R. T. Romine,  
Who Has Resigned Be-  
cause of Ill Health

DETROIT, Oct. 24—Courtney Johnson has been appointed general sales manager of the Hudson Motor Car Co., succeeding R. T. Romine, who has resigned because of ill health, it was announced today by O. H. McCornack, vice-president.

Mr. Johnson has been in the industry 15 years and with the Hudson organization as a sales executive for five years. In this time he has traveled extensively over the United States and has become well acquainted with both the national sales conditions and with the members of the Hudson-Essex sales organization.

In his new position Mr. Johnson becomes head of a sales system which has more than 5000 distributors and dealers in the United States and which for several years has sold an average of over 250,000 6-cylinder cars annually. In 1928 this organization has scored its greatest sales total and sales plans are now complete for even a larger and more aggressive campaign in 1929.

Mr. Johnson, a Princeton man, spent his early years in the industry with the Dort Motor Car Co. and after leaving there was associated with Gardner for a short time before joining Hudson.

## Opens Spokane Office

SPOKANE, Oct. 23—Opening of a district office of the Hudson Motor Car Co., increase in the number of Inland Empire dealers directly associated with the factory, increase of retail outlets of John Doran Co., distributor for the factory in Spokane County, and plans for an aggressive advertising campaign by the factory, were announced in Spokane recently by C. M. Braum of Seattle, zone sales manager of the company.

## Danish Show Date Selected

WASHINGTON, Oct. 25—The period of from Feb. 22 to March 3, 1929, has been selected for the next annual automobile exhibition in Denmark, which will include passenger cars only, the Department of Commerce is advised by representatives in Copenhagen. Trucks and other vehicles will be exhibited March 9-17; both shows being held in the Forum. A new three-wheeled German truck has been introduced.

## Studebaker Transfers Men

DETROIT, Oct. 23—Studebaker Corp. of America will transfer several hundred men from its plant No. 3 here to South Bend some time after Nov. 1, when the local plant is closed for inventory. Possibly 400 of an aggregate of 5000 men are concerned.

## Traffic Congestion Now Extending Into Country

WASHINGTON, Oct. 25—Traffic congestion heretofore considered a problem only in cities, has spread into the country, according to a survey just completed by the U. S. Bureau of Public Roads, making certain recommendations for future construction of highways tending to increase speed and decrease menace to life and property.

The outstanding need, the department advises, for highways is the acquisition of wider right-of-ways in order to allow for future widening of same. It also demands that highways be designed for safe use at higher speeds, and that arterial routes be improved with the service of the entire route in mind. In metropolitan areas congestion has emphasized the urgency of grade crossing elimination, wider pavements, and the building of relief and by-pass highways.

## Nash Exports Gain 50%

NEW YORK, Oct. 23—Returning from the European shows, C. W. Nash, president of Nash Motors Co., said company exports will show an increase of 50 per cent in 1928 over 1927 and will approximate 10 per cent of the total business. Plans call for expenditure of \$2,500,000 in 1929 to enlarge facilities. In Europe generally, he said, the automotive industry is showing a decided upward trend, offering American cars tremendous possibilities.

## Wire Wheel to Extend Plant

BUFFALO, Oct. 20—The Wire Wheel Corp. of America announced this week plans for an extension to its plant which will provide for a 50 per cent increase in volume of business. Directors also have authorized the purchase of adjacent property to provide for future expansion. Regular dividends were declared.



## Steel Mills Stiffen Rejection Attitude

### Operations Continue Far in Advance of 1927 — No Soft Spots in Market

NEW YORK, Oct. 25—While shipments are beginning to make more of a dent in backlogs, new business consisting chiefly of small tonnages for immediate shipment, the steel industry continues to fare extraordinarily well. Compared with market conditions in October last year, when there was a \$2 per ton recession in sheet prices, followed by pronounced dullness in the demand for full-finished automobile sheets, the present, with no soft spots in evidence anywhere and some descriptions of steel tending higher, marks indeed a phenomenal state of affairs.

Producers, however, are not carried away by prevailing conditions, and proceed on the assumption that the pressure on their capacity will lessen from now on. In full-finished automobile sheets over-fastidious consumers encounter more determined opposition to claims for rejection. For some time finishers have balked against the capriciousness of some consumers, and putting their unwillingness to submit to hairsplitting in the matter of material coming up to specifications on the broad ground of economic wastefulness, they are making considerable headway in eliminating heavy losses heretofore incurred by too ready acquiescence in rejections.

New business in cold-rolled strip steel is booked at 2.85 cents, Pittsburgh or Cleveland. Higher prices for hot-rolled strip for first quarter 1929 bookings are under consideration. Demand for automotive alloy steels continues good. A slight tapering off in automotive takings of bolts and nuts is reported. Steel mills anticipate very little in the way of postponements of shipments as the result of inventory-taking in automotive plants. All in all, it looks as though there was a lessening of the tension of the past few weeks in sight, but that this will hardly affect the firmness that is in evidence in virtually all departments of the steel market.

**Pig Iron**—The market continues firm, with Michigan first quarter 1929 delivery quoted at \$18.50. The Valley market for foundry iron is quotable at \$17 @ \$17.50.

**Aluminum**—The European metal trade press is carrying on active propaganda for lower aluminum prices. The Germans point out how much American copper could be displaced by lowering the price for aluminum. With copper prices hardening, continuance of prevailing aluminum quotations would achieve the same end. The market and conditions surrounding it remain entirely unchanged.

**Copper**—The market's advancing tendency is ascribed to precipitate buying by consumers. Producers are striving to prevent further pyrotechnics at this time. They are reluctant to quote for first quarter 1929 shipment.

**Tin**—With admission of the ordinary

shares of the London Tin Syndicate, closely related with the recently formed London-Malayan tin trust, to the unlisted trading facilities of the New York Curb Market, speculative facilities, generally expected to be greatly broadened by the impending opening of the National Metal Exchange, are still further enhanced. Traders will be enabled to switch from metal to shares and vice versa, as conditions change. As a result, the tin market, which has turned higher and stronger, is likely to come in for even more speculative activity than it has in the past.

**Lead**—Quite a little metal is being bought for immediate shipment. The market is steady.

**Zinc**—With the demand continuing moderate, prices remain pegged at previous levels.

## Rubber Stocks in Malaya Show Gain in September

NEW YORK, Oct. 22—Crude rubber stocks in Malaya on Sept. 30 were 70,711 tons, according to Reuter dispatches, as reported by F. R. Henderson Corp. This compares with 65,052 at the end of August and 62,721 at the end of July. In view of these figures, the Henderson company feels that it is justified in maintaining its earlier prediction that there would not be in excess of 60,000 tons surplus on the estates at the end of the restriction period, which takes place at the end of this month.

Trading last week was quiet and steady.

Stocks in London decreased to 27,370 tons, with total arrivals in New York from Oct. 1 to 19 estimated at 14,200 tons.

## Champion Plans Building to Perfect New Plugs

TOLEDO, Oct. 23—Rapid development of high-compression engines and aviation power units has led to complete changes in spark plug manufacture in the last five years, according to M. C. Dewitt, vice-president of the Champion Spark Plug Co., in announcing construction of a new \$25,000 plant addition here for improvement of finishing processes in the making of some of the new types of plugs.

The company has been turning out 200,000 spark plugs a day in October and this is more than 50 per cent greater production than at the same time last year.

## Fokker Designs New Planes

NEW YORK, Oct. 23—Fokker Aircraft Corp. has designed a new line of planes on which it expects to start production shortly. Complete details are not yet available but among the new planes is to be included a large transport plane which will be larger than anything yet made in that field. There is also included an amphibian monoplane with a new float and retractable landing gear design. A third type is an enclosed cabin monoplane, with a seating capacity of two to four passengers, for use in training purposes as well as personal and commercial transportation.

## Business in Brief

Written by the Guaranty Trust  
Co., New York, exclusively for  
AUTOMOTIVE INDUSTRIES.

NEW YORK, Oct. 25—Retail trade continues to hesitate in view of the prolonged warm weather, and wholesalers and jobbers are feeling the reactionary influences. However, normal temperatures are expected to bring with them the usual stimulus to trade.

### FREIGHT CAR LOADINGS

Car loadings for the week ended Oct. 6 amounted to 1,186,598 cars, which, although marking a decrease of 10,170 cars below the figure for the preceding week, showed an increase of 83,604 cars above the car loadings for the corresponding week in 1927 and an increase of 11,670 above the figure for the similar period in 1926.

### ELECTRICITY CONSUMPTION

The consumption of electricity by 3600 manufacturing plants in September, according to the Electrical World, increased 11.4 per cent over that for August and 13.5 per cent above the rate of consumption for September, 1927. The rate of consumption of electrical energy by these manufacturing plants, corrected for the variation in the number of working days, was 5.4 per cent above the previous high record established in February of the current year.

### PETROLEUM OUTPUT

The average daily crude oil production in the United States for the week ended Oct. 13 was estimated at 2,505,500 bbl., showing a decrease of 18,500 bbl. under the figure for the preceding week, but an increase of 11,150 bbl. over average daily production in the corresponding week last year.

### FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Oct. 20 was 98.9, as compared with 99.4 for the week before and 99.2 two weeks before.

### BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended Oct. 17 were 2 per cent below those in the corresponding week last year. This decrease is the result of the Columbus day holiday, which fell in the week of Oct. 17 this year, but in the preceding week last year.

### FEDERAL RESERVE REPORT

The consolidated statement of Federal Reserve banks for the week ended Oct. 17 showed increases of \$47,600,000 in bills bought in the open market and of \$4,700,000 in holdings of government securities, which partially offset a decrease in holdings of discounted bills of \$57,600,000. This decrease in holdings of discounted bills is largely the result of the heavy government deposits with member banks in that week, representing the proceeds of the issue of new Treasury certificates.

## Baltimore Opens Car Service School

BALTIMORE, Oct. 20—With the cooperation of the automobile trade in Baltimore, the public school officials have opened a new vocational school for automobile mechanics in the old City College Building. Enrollment has been far in excess of the facilities—both day and night classes have been established. A model shop and laboratory are features of the school. The officials plan to turn out mechanics thoroughly trained to step into the industry.

The school is unique in its operation. Although conducted by the public school officials it also has the advantage of the ideas of an advisory committee made up of prominent men in the trade. This committee works in close cooperation with the school officials. It was organized recently and is made up of John E. Raine, general manager of the Automobile Trade Association of Maryland; Walter F. Kneip, Franklin-Oldsmobile; Thomas G. Young, head of the Auto Supply Co.; Charles R. Gonce, Franklin; Thomas W. Wilson, Jr., Nash, and W. R. Carr, Dodge-Graham.

## Fisher Buys Plywood

PORTLAND, ORE., Oct. 20—At a contract price of \$780,000 the Vancouver (Wash.) Plywood Co. has secured an order from the Fisher Body Co. for requirements in the next 11 months on plywood sills and body parts, shipments to average a carload a day for their St. Louis and Memphis plants. Contract was secured as direct result of revolutionary development of the seven-ply sill for automobile bodies and after most rigorous service tests.

## Auburn Completing Units

CHICAGO, Oct. 22—Auburn Automobile Co. will soon complete its new building program at its Connorsville plant aggregating approximately \$450,000. The new additions will contain 250,000 sq. ft. of floor space and provide for an export assembly department, a new enameling plant and final testing department.

## Coming Feature Issue of Chilton Class Jour- nal Publications

Nov. 17—Production and Factory Equipment Issue—Automotive Industries.

## Canadian Exports Show 41% Increase in August

WASHINGTON, Oct. 20—Exports of Canadian passenger automobile and trucks totaling 11,011 in number and valued at \$4,216,903 were shipped during August, 1928, reporting an increase of almost 41 per cent in value over July, 1928, when the exports totaled \$2,991,649, according to statistics forwarded to the Department of Commerce.

The average value of passenger cars exported was \$393, as compared with \$376 in July. Passenger car exports alone were 22 per cent greater in August than in July, and more than double the number shipped in July 1927.

## Fokker Building 10 Planes

NEW YORK, Oct. 20—Fokker Aircraft Corp. is now manufacturing 10 of its large trimotor monoplanes of the F-10-A type at its plants in Wheeling, W. Va., Hasbrouck Heights, N. J., and Passaic, N. J., for the order of the Western Air Express. One of them will be employed to inaugurate the service between Los Angeles and San Francisco and six will be available for operation on new lines projected by the Western company.

## To Finance Swiss Sales

NEW YORK, Oct. 17—The First Foreign Investment Trust Co. has incorporated the International Credit & Securities Corp. in Switzerland, to handle the financing of the sale of American products, primarily automobiles, in that country. The headquarters of this company will be in Zurich.

This company is but one of a number of such projects launched by the American company during the last two years

## Federal Aid Roads Increase 8184 Miles

WASHINGTON, Oct. 20—With states cooperating, 8184 miles of Federal-Aid highways were improved in the fiscal year, 1927-1928, and 2014 miles previously improved by the Federal-Aid were given better surfaces, according to the Bureau of Public Roads of the Department of Agriculture.

Of the 13,911 miles of roadway in the national forest system, 281 miles of roads were improved under the supervision of the bureau during the last fiscal year, making the total improved mileage of these roads 3775 miles.

The work in the states, involving a total of 10,198 miles of road, including improvements and resurfacing, was done at a total cost of \$205,043,000, of which the Federal government paid 43 per cent, or \$88,056,000, with the states paying the balance.

## Ohio Employment Gains

COLUMBUS, Oct. 20—The Bureau of Business Research of Ohio State University in an advance bulletin covering employment in the automobile and automotive parts industries in Ohio, shows that September employment was 6 per cent greater than in August this year and 30 per cent greater than in September, 1927. This increase over August employment was shared by 29 of the 45 reporting concerns, while 15 showed decreases and three showed no change. Average employment during the first nine months of the present year was 1 per cent greater than during the corresponding period in 1927.

## C.I.T. Buys Carolina Credit

NEW YORK, Oct. 20—Commercial Investment Trust Co. has purchased the Carolina Credit Co., the largest finance company in the Carolinas. This new acquisition of the C. I. T. has resources of more than \$2,250,000 and maintains offices in Greensboro, Winston-Salem and Hickory, N. C. This addition raises the number of C. I. T. offices maintained throughout the United States to 85 and places its resources in excess of \$134,000,000.

# Calendar of Coming Events

### SHOWS

Aeronautical Exposition, Coliseum, Chicago ..... Dec. 1-9  
American Road Builders Association, Inc. Cleveland Auditorium.....Jan. 14-18  
Automobile Salon, Inc., Hotel Drake, Chicago .....Jan. 26-Feb. 2  
Automobile Salon, Inc., Hotel Biltmore, Los Angeles.....Feb. 9-16  
Automobile Salon, Inc., Hotel Commodore, New York .....Dec. 2-8  
Automobile Salon, Inc., Palace Hotel, San Francisco .....Feb. 23-Mar. 2  
Berlin .....Nov. 8-15  
Boston, Mass., Mechanics Bldg.....March 2-9  
Brussels .....Dec. 8-19  
Buenos Aires .....Nov. 29-Dec. 3  
Chicago, National, Coliseum, Jan. 26-Feb. 2  
Montevideo .....Nov. 10-19  
National Standard Parts Association, Cleveland Auditorium.....Oct. 29-Nov. 2

\* Will have special shop equipment exhibit.

\*New York National, Grand Central Palace .....Jan. 5-12  
Paris, trucks .....Nov. 15-25  
Western States Metal and Machinery Exposition, Los Angeles.....Jan. 14-18

### CONVENTIONS

American Road Builders Ass'n, Inc., Cleveland Auditorium .....Jan. 14-18  
American Society for Steel Treating, Semi-Annual Meeting, Los Angeles .....Jan. 11-13  
National Highway Traffic Assoc., New York City, 12 E. 53rd St.....Dec. 10-12  
Chicago Power Exhibition and Conference, Coliseum, Chicago .....Feb. 12-16  
National Automotive Parts Assoc., Detroit, Mich. ....Oct. 29-Nov. 3  
International Air Conference, Washington .....Dec. 12-14  
Chicago Aeronautical Assoc., Stevens Hotel, Chicago, Ill.....Dec. 5-6

Manufacturers & Distributors of Motor Truck Equipment, Cleveland, Ohio .....Jan. 15  
National Association of Finance Companies, Hotel Roosevelt, New York .....Nov. 20-21  
National Automobile Dealers Association, Palmer House, Chicago.....Jan. 28-29  
National Metal Congress, Los Angeles .....Jan. 14-18  
National Research Council, Washington .....Dec. 13-14  
National Standard Parts Association, Hollenden Hotel, Cleveland, Oct. 29-Nov. 2

### S. A. E. National

Chicago, Dec. 6-7—Aeronautics.  
Detroit, Book-Cadillac, Nov. 22-23—Production  
Detroit Book-Cadillac, Jan. 15-18—Annual.  
New York, Hotel Astor, Jan. 10—Annual Dinner.